

BOTANICAL SURVEY OF SOUTH AFRICA

(No. 1000 of 12)

THE GRASSES OF SOUTH AFRICAN
FLOWERING PLANTS



BY J. E. BURTON,
F. R. S. (Lond.)

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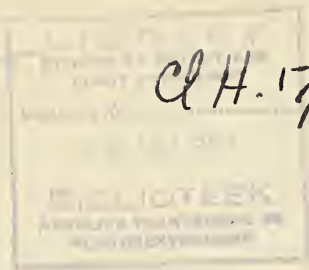
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South African National
Biodiversity Institute

THE
GENERA OF SOUTH AFRICAN
FLOWERING PLANTS

BY

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1926.



Division of Botany,
Pretoria.

January 11th, 1926.

SIR,—I have the honour to transmit herewith the manuscript of a paper entitled "The Genera of South African Flowering Plants" by Dr. E. P. Phillips, Senior Botanist of this Division, and I beg to recommend that it be published by the Department as Botanical Survey Memoir No. 10. It will bring together in a single convenient publication our knowledge of the genera of South African flowering plants and will be of great value to all students of our flora.

As it is as far back as 1868, that the late Sir Joseph Hooker published the second edition of Harvey's "Genera of South African Plants" a great need has been felt for a similar work brought up to date, and the Botanical Survey Committee after careful consideration of the matter entrusted this arduous task to Dr. Phillips. Since the second edition of Harvey's "Genera of South African plants" was published the exploration of our flora has made tremendous strides, especially in Natal, the Transvaal, and South-West Africa, which at that period were almost *terrae incognitae*, while in the Cape Province many new genera have been found, and others have become better known or have been remodelled. All these have now been conveniently incorporated in Dr. Phillips' work, and it should therefore be a great boon to all botanical workers in this country even if they have large libraries at their disposal. It will also be of great assistance to foresters, teachers in secondary schools, and to students of our Universities, as well as to officers in Government Departments. The elaborate keys, which have been constructed with scrupulous care and which have as far as possible been repeatedly tested, will be found most useful. In fact it is confidently expected that Dr. Phillips' work on the genera of South African plants will act as a great stimulus to advance the study of our immensely varied and intensely interesting flora.

The opportunity is herewith taken of making grateful acknowledgment to A. K. Bulley, Esq., of Nees, Neston, Birkenhead, England, for the very handsome donation which he has made towards the publication of this Memoir.

I have the honour to be

Sir,

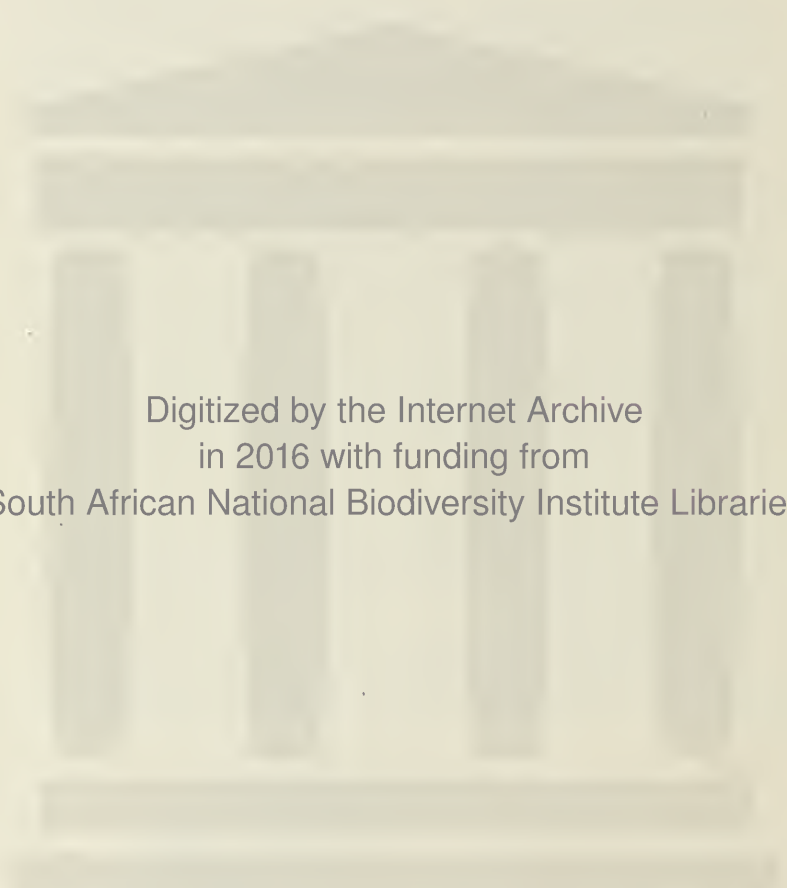
Your obedient Servant,

I. B. POLE EVANS,

Director,

Botanical Survey of South Africa.

The Secretary for Agriculture,
Pretoria.



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PREFACE.

For many years past there has been an increasing demand for a handy account of the South African Phanerogams. There are of course many standard works published but most of these are not within the means of the ordinary student of our native flora. It is to meet this need that the present volume was compiled.

The suggestion that a work of this nature should be published was made by the Committee of the Botanical Survey of the Union of South Africa, and the writer was entrusted with the task. The work is a compilation as the writer has drawn freely on various sources for information, but there appears to be no need to cite all the publications consulted. The only originality claimed for it lies in the keys to the families and genera. No doubt these are open to criticism as being too artificial but the fact that the genera are indicated also under tribes may perhaps in some way compensate for this.

In the arrangement of the genera De Dalle Torre and Harms' "Genera Siphonogamarum" has been followed. For the subdivision of the families into tribes, the arrangement in the later volumes of the "Flora Capensis" and Bentham and Hooker's "Genera Plantarum" has been adopted. In preparing the keys both to the families and the genera, often only characters exhibited by the South African representatives have been used, so that in most cases the keys may break down if they are used to run down a plant which does not occur in South Africa, though the genus may be represented there.

The writer is indebted to the Director of the Royal Botanic Gardens, Kew, for copies of generic descriptions which were not available in South Africa; to Mr. N. E. Brown, A.L.S., for descriptions and a key to the genera of *Aizoaceae* allied to *Mesembrianthemum*; to Mr. N. S. Pillans of the Bolus Herbarium for the account of the *Restionaceae*. Miss Sydney Stent of the National Herbarium very kindly compiled descriptions of genera of the *Gramineae*, but these the writer has re-written and re-modelled to suit the present publication and he must therefore accept full responsibility for the descriptions as published as well as for the key to the genera. To Miss I. C. Verdoorn and Miss J. Hofmeyr of the National Herbarium he is under a great debt of gratitude for their valuable assistance. All the generic keys have been tested by them on the material in the National Herbarium and as a result many errors were rectified and many generic descriptions modified or amplified. In the same way Miss Verdoorn has tested the key to the families. Dr. S. Schönland of Grahamstown has been good enough to read through the typescript and has offered many valuable suggestions. That no defects remain or that all mistakes have been detected is perhaps too much to expect, but he trusts that any such will be brought to his notice.

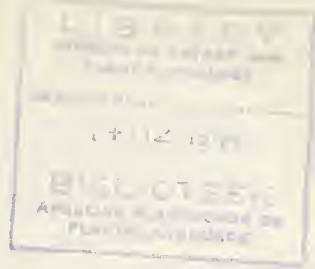
Dr. I. B. Polc-Evans, C.M.G., Chief of the Division of Botany and Director of the Botanical Survey has granted every facility for preparing this work and for this and the interest he has taken the writer is deeply grateful.

E. PERCY PHILLIPS.

National Herbarium,
Division of Botany,
Pretoria, 1926.

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INTRODUCTION.

Any student who has a keen desire to become acquainted with the flora of his district should begin to build up a herbarium of local plants. It is only by collecting specimens himself and preparing them for a herbarium that he will eventually acquire a sound working knowledge of the plants he comes across.

The proper use of the keys and descriptions given in the following pages will necessitate at least an elementary knowledge of the parts of the plant and of botanical terms. The latter cannot be avoided and in cases of doubt as to the meaning of any term, the student is referred to Jackson's "Glossary of Botanical Terms"—an invaluable book to anyone studying systematic botany.

The study of any local flora may be taken up with more than one object in view. The student may merely wish to know the names of the plants he comes across, he may be undertaking a general description of the vegetation of a particular area, or he may be interested in plants from some economic point of view. No matter from what aspect he approaches the study of plants, the formation of a small private herbarium will be of great assistance.

The cost of maintaining a collection is trifling in comparison with the pleasure and use he will derive from it. Before commencing a collection, however, it would be very desirable if a visit could first be paid to one or other of the large herbaria in order to form some idea of the methods of preserving plant specimens so as to be readily available for reference. It might be emphasised here that any herbarium, no matter how small, should not merely be a collection of dried plants with a botanical name attached. Every specimen should have attached to it as much information as it is possible to give. Do not commence botanical collecting by being merely a collector of plants, rather commence as a recorder of botanical information about plants, and remember that a dozen good specimens with reliable field notes attached is usually of far more scientific value than fifty specimens with merely the locality and date of collecting recorded. The resident collector can perhaps do more than anyone else to extend our knowledge of plants as they grow. He is on the spot and can observe the times of flowering, fruit formation, methods of seed dispersal, methods of pollination, etc., in fact all the data connected with the life-history of the plant. The life-histories of most of the native plants of South Africa is unknown and a large field for original work in this respect remains to be explored. If every student besides his general collecting would concentrate on one species at a time and collect the plant in all stages he would materially benefit botanical science.

Because a herbarium may be put to some practical use it does not follow that it need not contain well-selected, well-prepared, and neatly mounted specimens. If one intends collecting plants either for oneself or for a public herbarium, be a collector of good specimens. At the time of

collecting a plant, bear in mind what will eventually become of it as a herbarium specimen and select specimens with this end in view; most good herbarium specimens are prepared in the field. After having carefully selected the specimens, the whole secret of ultimate success is (1) to place the specimens under some pressure as soon as possible after they are collected, and (2) to extract the moisture from them as rapidly as possible.

For any serious collecting one must be provided with (1) drying paper cut to a uniform size and in single sheets (a strong absorbent paper is sold for this purpose, but newspapers cut to 24 by 12 inches are quite suitable), (2) a collecting frame, (3) boards for use in drying specimens. The collecting frame may be made of stiff cardboard (24 by 12 inches), with a pair of straps attached or a wire collecting frame may be bought for a few shillings and a pair of straps rivetted on. The drying boards should be slightly larger than the drying paper and should be in the form of a lattice, as this allows a free current of air between the driers and so facilitates the more rapid drying of the specimens.

When out collecting a supply of labels should always be carried and the notes written up on the labels at the time of collecting the specimens. Quite a suitable label for this purpose is a plain piece of white paper 5 by 3 inches with two slits for easy attachment to the specimen. After a day's collecting the specimens gathered are placed between the drying papers in such a way that one specimen does not overlap the other, and between each set of specimens four or five sheets of driers are inserted and the bundle built up in this way is put between the lattice frames and placed in the sun to dry. As the specimens dry they contract and if allowed to contract too much bad herbarium specimens will result. To obviate this a weight (30-40 lbs.) is placed on top of the bundle and the specimens thus kept under a uniform pressure. Each day the plants must be removed from the damp driers and placed between fresh sheets of paper and this process is repeated until the specimens are dry and crisp. It is not possible in a short introduction to go into much detail. Experience will show that different types of plants require different treatment to obtain the best results and the student will learn much if he has the opportunity of accompanying a trained collector in the field.

After the specimens are thoroughly dry they are then mounted for the herbarium. The mounting sheets should be of a good stiff cartridge paper. There are two methods commonly used for mounting specimens, *viz.*:— (1) the specimens are attached to the mounting sheets by strips of gummed paper, or (2) the specimens are glued to the sheets. If the latter method is used "Le Page's Liquid Glue," is a suitable medium for the purpose.

Each specimen should have a collector's number which must run consecutively from No. 1 onwards. *Never use the same number twice for a plant.* The collector's label with his number is placed at the right-hand bottom corner of the herbarium sheet.

After a collection has been mounted and labelled it is ready for placing in the herbarium. For this purpose double sheets of paper known as "species covers" and "genus covers" are used to hold the mounted sheets. The species covers are sheets of plain white paper, slightly larger than the mounting sheets, and in them are placed all the specimens of the same species. The genus covers should be of stouter paper and contain the species of the same genus. On the outside of the genus cover in the bottom left-hand corner is printed the name of the genus; in the bottom right-hand corner the number of the genus as given in the following pages. The genus covers containing the specimens are then stored in a cabinet which should be dust- and insect-proof.

The most suitable type of cabinet is what is known as the "Kew" type. This consists of fourteen pigeon holes in two rows, each 18 inches deep, 12 inches wide and 6 inches high, so that they take the genus covers with their contained specimens easily. The cabinet should be fitted with two doors.

The above is a very brief outline of the procedure to be followed in commencing a herbarium and in conclusion it should again be emphasised that the beginner should visit some large herbarium and obtain further advice.

In preparing the keys to the families and genera given in the following pages only characters have been used which are usually visible to the naked eye if fresh specimens are handled, but for many families such as the *Gramineæ*, *Cyperaceæ*, etc., a more minute examination is essential. For the smaller details a pocket lens with a magnification of six diameters is quite sufficient. When handling a fresh specimen and using the key to determine to which family it belongs, the order of examination, if the plant is a dicotyledon, should be: (1) *Leaves*: Are they opposite or alternate, simple or compound. (2) *Flowers*: (a) is a calyx and corolla present, if so, are the petals free or joined (b) has the flower only one perianth-whorl, and if so, is it of free or joined segments, (c) is the flower naked, i.e., both perianth whorls absent. (3) is the ovary superior or inferior. These simple characters almost all seen without the aid of a lens, unless the flowers are very small, will place the plant in one of the thirty-two sections into which the key is divided. The next step is to carefully examine the ovary and to determine the number of the chambers and the number and position of the ovules. To do this the ovary is cut through transversely and examined with a pocket lens when the number of chambers may usually be easily counted. It may be necessary, however, to cut another section longitudinally to determine the attachment of the ovules.

When dealing with dried herbarium specimens the methods of examination are the same but the student should furnish himself with a simple dissecting microscope, a pair of dissecting needles, and a small scalpel. There are many types of dissecting microscopes on the market, but a simple stand with an adjustable arm to hold the lens and furnished with a focussing screw will be found to be quite suitable. Before taking a flower from the herbarium sheet, first examine it with a lens to see whether it appears to be in the right condition for dissection. Carefully detach the flower from the sheet and soak it in a small dish in warm water which drives out the air, softens the tissues, and enables the various organs to be easily separated. The amount of soaking required or whether the flower should be boiled for a few seconds will depend entirely on the type of flower and the method employed can only be learnt by experience. Always make a practice of dissecting a flower in a flat-bottom dish containing a little water as then the parts will float off and not be torn. If the flower has a tubular calyx first open this by slitting it up one side and so expose the corolla. If the petals are joined a similar slit will enable one to lay it open and so expose the stamens and gynæcium. Remember the flower should be carefully dissected in definite stages and not torn to pieces. For a proper dissection the dissecting needles should have long fine points and the scalpel a keen edge. To make a neat dissection which will enable one to examine all the organs of the flower carefully needs practice, and it is only by practice and experience that the best method of dealing with a particular type of flower is gained.

KEY TO THE FAMILIES

1. Ovules naked, not enclosed in an ovary or infolded carpels 2
 Ovules produced in an ovary formed of joined carpels or of one carpel
 with joined margins 5

2. Leaves pinnately compound or dissected, forming a crown on top of
 the stem; stamens with numerous pollen-sacs **Cycadaceae**
 Leaves undivided, scattered along the branches of the stem, rarely
 leaves 2 and arising from the top of a turnip-shaped stem and some-
 times splitting length-wise; stamens with 1—9 pollen-sacs 3

3. Perianth present **Gnetaceae**
 Perianth absent 4

4. Seeds overtopping the fleshy or rudimentary carpels and surrounded
 by a fleshy aril; carpels with 1 ovule **Taxaceae**
 Seeds concealed between the carpels, without an aril; carpels usually
 with 2 or more ovules **Pinaceae**

5. Embryo with 1 cotyledon; vascular bundles scattered in the stem;
 leaves usually paralled veined; flowers usually 3-merous 6
 Embryo with 2 cotyledons, rarely with only 1 well developed cotyledon
 or undivided; vascular bundles nearly always arranged in a cylinder;
 leaves usually net-veined; flowers usually 4—5-merous 48

6. Perianth glumaceous or represented by linear scales or absent 7
 Perianth petal- or sepal-like or differentiated into a calyx and corolla,
 sometimes absent 18

7. Aquatic or marsh plants, with long erect stems (4 ft. or more); leaves
 strap-shaped; inflorescence cylindric, compact, bearing unisexual
 flowers **Typhaceae**
 Terrestrial, aquatic, or marsh plants; inflorescence various but never a
 long dense cylindric spike 8

8. Perianth glumaceous, or of 6 segments in 2 rows or flowers in the axil
 of a bract (valve), usually subtended by a bracteole (pale) and
 usually surrounded by 2 outer bracts (glumes)... .. 9
 Perianth 0, rarely represented by linear scales 11

9. Perianth of 6 segments in 2 rows; stems solid; leaf-sheath, when present,
 without a ligule 10
 Flower surrounded by bracts (valves and glumes) and a bracteole (pale);
 stems often hollow; leaf-sheath usually split and ending in a ligule
 Gramineae

10. Flowers bisexual; stamens usually 6; ovules 2 or more in each ovary-
 chamber **Juncaceae**
 Flowers unisexual; stamens 3; ovule solitary in each ovary-chamber
 Restionaceae

11. Flowers on a cylindric fleshy spadix, surrounded by a large trumpet-
 shaped spathe **Araceae**
 Flowers various, if in a spadix and surrounded by a spathe, then aquatic
 with the leaves in a rosette 12

12. Aquatic plants, either free-floating or submerged or with the leaves floating 13
 Terrestrial or marsh plants, sometimes found growing in water, but then the leaves never opposite and the ovary 1-chambered with a single ovule **Cyperaceae**
13. Free-floating plants represented by a thallus (not differentiated into stem and leaves); flowers very minute, situated in cavities on the thallus **Lemnaceae**
 Plants differentiated into stem and leaves 14
14. Gynaecium of 3—8 free carpels or, if of 1 carpel, then the ovule solitary; leaves opposite or alternate 15
 Ovary 1-chambered, with numerous basal ovules; leaves in a rosette
Araceae
15. Flowers unisexual; stamen 1; carpels 1—4 16
 Flowers bisexual; stamens 2—6 or more; carpels 3—8 17
16. Stamens enclosed in a bottle-shaped spathe ... **Naiadaceae**
 Stamens naked **Potamogetonaceae**
17. Leaves with a stipule-like sheath; stamens 2 ... **Potamogetonaceae**
 Leaves without a stipule-like sheath; stamens 5—6 or more
Aponogetonaceae
18. Flowers bisexual 19
 Flowers unisexual, sometimes polygamous 40
19. Ovary superior or carpels free 20
 Ovary inferior or half-inferior 32
20. Aquatic plants with floating or submerged leaves 21
 Terrestrial plants, sometimes found in damp or marshy places... .. 23
21. Perianth-segments 6, in 2 rows of 3 each; stamens 3; ovary 1-chambered; ovules many **Mayacaceae**
 Perianth-segments 1—4; stamens 4—6; gynaecium usually of free carpels, if of 1 carpel only, then ovule solitary... .. 22
22. Perianth of 4 green segments; stamens 4; ovule solitary in each carpel
Potamogetonaceae
 Perianth of 1—3 equal or unequal segments; stamens 5—6 or more; ovules basal or parietal, 2—8 in each carpel ... **Aponogetonaceae**
23. Gynaecium of 3 almost free carpels; fruit elongated, cylindric and 3-lobed at the apex or the carpels breaking away from a 3-winged axis **Juncaginaceae**
 Ovary 1-chambered with 3 parietal placentas or 2—3-chambered (gynaecium never of almost free carpels); fruit a capsule or berry, never with 3 recurved apical lobes, very rarely with spreading lobes, but then perianth-segments with an auricle on the face 24
24. Fertile stamens 2—3, sometimes 3—4 barren stamens present 25
 Fertile stamens 6, rarely 5, but then the ovary is 2-chambered 30
25. Ovary 2—3-chambered, sometimes 2 of the chambers without ovules 26
 Ovary 1-chambered 28
26. Stamens 6, but only 2—3 fertile 27
 Stamens 3, all fertile **Haemodoraceae**

carpels; ovary superior, rarely inferior, generally 1-chambered with 1 to many ovules, rarely many-chambered; seed with perisperm; embryo curved; mostly herbs.

Family 51. *Chenopodiaceae*. 52. *Amarantaceae*. 53. *Nyctaginaceae*. 54. *Phytolaccaceae*. 55. *Aizoaceae*. 56. *Portulacaceae*. 57. *Basellaceae*. 58. *Caryophyllaceae*.

Order 10. *Ranales*: Flowers spiral to cyclic, regular or irregular; perianth of similar or dissimilar segments; stamens usually many; gynæcium of 1 to many carpels, usually apocarpous, rarely syncarpous.

Family 59. *Nymphaeaceae*. 60. *Ceratophyllaceae*. 61. *Ranunculaceae*. 62. *Menispermaceae*. 63. *Anonaceae*. 64. *Monimiaceae*. 65. *Lauraceae*. 66. *Hernandiaceae*.

Order 11. *Rhoeadales*: Flowers cyclic, except sometimes the stamens, regular or irregular; perianth of dissimilar segments, rarely apetalous or of similar segments; gynæcium of 2 to many syncarpous carpels; ovary superior.

Family 67. *Papaveraceae*.* 68. *Cruciferae*. 69. *Capparidaceae*. 70. *Resedaceae*. 71. *Moringaceae*.

Order 12. *Sarraceniales*: Flowers hemicyclic to cyclic, regular; perianth of similar or dissimilar segments; gynæcium of 3-5 syncarpous carpels; ovary superior, with many ovules on parietal or axile placentas; seed small; endosperm present; herbs; leaves usually alternate, entire, covered with glandular hairs for catching insects.

Family 72. *Droseraceae*.

Order 13. *Rosales*: Flowers cyclic or rarely hemicyclic, regular or zygomorphic; perianth of dissimilar segments, or flowers apetalous; carpels syncarpous or apocarpous.

Family 73. *Podostemaceae*. 74. *Hydrostachyaceae*. 75. *Crassulaceae*. 76. *Saxifragaceae*. 77. *Pittosporaceae*. 78. *Cunoniaceae*. 79. *Myrothamnaceae*. 80. *Bruniaceae*. 81. *Hamamelidaceae*. 82. *Rosaceae*. 83. *Connaraceae*. 84. *Leguminosae*.

Order 14. *Geraniales*: Flowers cyclic; usually 5-merous; perianth of dissimilar segments, or petals absent, rarely perianth absent; andræcium various; gynæcium of 5-2, rarely more, syncarpous carpels; ovary superior, with 2-1, rarely many, ovules in each chamber; ovules with a ventral raphe and a micropyle pointing upwards; carpels often separating from one another when ripe.

Family 85. *Geraniaceae*. 86. *Oxalidaceae*. 87. *Linaceae*. 88. *Erythroxylaceae*. 89. *Zygophyllaceae*. 90. *Rutaceae*. 91. *Simsarubaceae*. 92. *Burseraceae*. 93. *Meliaceae*. 94. *Malpighiaceae*. 95. *Polygalaceae*. 96. *Dichapetalaceae*. 97. *Euphorbiaceae*. 98. *Callitrichaceae*.

Order 15. *Sapindales*: As in *Geraniales*, but ovules with a dorsal raphe and micropyle pointing downwards.

Family 99. *Buxaceae*. 100. *Anacardiaceae*. 101. *Aquifoliaceae*. 102. *Celastraceae*. 103. *Hippocrateaceae*. 104. *Iacinaceae*. 105. *Sapindaceae*. 106. *Melanthaceae*. 107. *Balsaminaceae*.

Order 16. *Rhamnales*: Flowers cyclic, regular; perianth of dissimilar segments, sometimes petals absent; stamens opposite the petals; gynæcium of 5-2 syncarpous carpels; ovules 1-2 in each ovary-chamber, ascending.

Family 108. *Rhamnaceae*. 109. *Heteropyxidaceae*. 110. *Vitaceae*.

Order 17. *Malvales*: Flowers cyclic, bisexual or rarely unisexual, usually regular; calyx usually 5 and valvate; petals usually 5, rarely absent; stamens numerous or in 2 whorls, with the inner divided; gynæcium of 2 to many carpels, with 1 to many anatropous ovules in each.

Family 111. *Tiliaceae*. 112. *Malvaceae*. 113. *Bombacaceae*. 114. *Sterculiaceae*.

Order 18. *Parietales*: Flowers cyclic or hemicyclic; calyx and corolla present, rarely petals absent; stamens often numerous; gynæcium of more or less united carpels; ovules often on parietal placentas.

Family 115. *Ochnaceae*. 116. *Guttiferae*. 117. *Elatinaceae*. 118. *Frankeniaceae*. 119. *Tamaricaceae*. 120. *Canellaceae*. 121. *Violaceae*. 122. *Flacourtiaceae*.

* NOTE.—The Family *Fumariaceae* should be inserted between *Papaveraceae* and *Cruiferae*.

ceae. 123. Turneraceae. 124. Passifloraceae. 125. Achariaceae. 126. Loasaceae. 127. Begoniaceae.

Order 19. Opuntiales: Flowers hemicyclie; sepals, petals, and stamens many, spiral; gynæcium of 4 to many carpels, with an inferior ovary.

Family 128. Cactaceae.

Order 20. Myrtiflorae: Flowers eyclie; calyx and corolla present, rarely petals absent; stamens in 1 or 2 whorls; gynæcium of 2 to many usually united carpels; leaves very often opposite or whorled.

Family 129. Geissolomataceae. 130. Penaeaceae. 131. Oliniaceae. 132. Thymelaeaceae. 133. Lythraceae. 134. Lecythidaceae. 135. Rhizophoraceae. 136. Combretaceae. 137. Myrtaceae. 138. Melastomaceae. 139. Enothereaceae. 140. Halorrhagidaceae.

Order 21. Umbelliflorae: Flowers cyclic, usually bisexual, usually 5-4-merous; stamens usually in one row and alternating with the petals; gynæcium of 5-1 or many joined carpels, with 1 or rarely 2 pendulous anatropous ovules; endosperm present; inflorescence usually an umbel.

Family 141. Araliaceae. 142. Umbelliferae. 143. Cornaceae.

SERIES II. SYMPETALAE: Perianth normally in 2 whorls, with the inner whorl of joined segments, rarely the inner whorl absent or of free segments.

Order 1. Ericales: Flowers 5-4-merous, bisexual, usually regular; sepals free or connate; stamens usually in 2 whorls, with the outer whorl opposite the petals, generally free from the corolla; gynæcium of 2 to many carpels, with a superior or inferior ovary.

Family 144. Ericaceae.

Order 2. Primulales: Flowers 5-, rarely 4 to many-merous, bisexual or unisexual, usually regular; petals rarely free; stamens opposite the petals and adnate to them; ovary superior to inferior, 1-chambered, with many to 1 ovules on a basal or free-central placenta.

Family 145. Myrsinaceae. 146. Primulaceae. 147. Plumbaginaceae.

Order 3. Ebenales: Petals united; stamens in 1, 2, or 3 whorls, rarely stamens many; ovary many-chambered, with 1 to few ovules on axile placentas.

Family 148. Sapotaceae. 149. Ebenaceae.

Order 4. Contortae: Flowers usually 5- (rarely 2-6-) merous; petals usually joined, usually convolute, sometimes valvate; stamens usually as many as the petals, sometimes fewer, usually united at the base to the corolla; leaves usually opposite, undivided; stipules 0.

Family 150. Oleaceae. 151. Salvadoraceae. 152. Loganiaceae. 153. Gentianaceae. 154. Apocynaceae. 155. Asclepiadaceae.

Order 5. Tubiflorae: Flowers typically in 4 isomerous whorls, often with a reduction in the gynæcium, if zygomorphic then also a reduction in the androeium; stamens epipetalous; ovules with 1 integument.

Family 156. Convolvulaceae. 157. Hydrophyllaceae. 158. Boraginaceae. 159. Verbenaceae. 160. Labiatae. 161. Solanaceae. 162. Scrophulariaceae. 163. Bignoniaceae. 164. Pedaliaceae. 165. Martyniaceae. 166. Orobanchaceae. 167. Gesneraceae. 168. Lentibulariaceae. 169. Acanthaceae. 170. Myoporaceae.

Order 6. Plantaginales: Flowers 4-merous, isomerous except in the gynæcium, bisexual or unisexual, regular; leaves alternate; mostly herbs.

Family 171. Plantaginaceae.

Order 7. Rubiales: Flowers typically 5-4-merous, with isomerous or oligomerous stamens and carpels, regular or zygomorphic; ovary inferior, 1 to many-chambered, with 1 to many ovules in each chamber; leaves usually opposite.

Family 172. Rubiaceae. 173. Valerianaceae. 174. Dipsaceae.

Order 8. Campanulales: Flowers typically 5-merous, with isomerous stamens and oligomerous carpels; anthers close together and often more or less united; ovary inferior, many-chambered with 1 to many ovules, or 1-chambered with 1 ovule.

Family 175. Cucurbitaceae. 176. Campanulaceae. 177. Goodeniaceae. 178. Compositae.

KEY TO THE FAMILIES.

1. Ovules naked, not enclosed in an ovary formed of united or infolded carpels 2
 Ovules produced in an ovary formed of joined carpels or of one carpel with joined margins 5
2. Leaves pinnately compound or dissected, forming a crown at the top of the stem : stamens with numerous pollen-sacs . . **Cycadaceæ**
 Leaves undivided, scattered along the branches of the stem, rarely leaves 2 arising from the top of a turnip-shaped stem and sometimes splitting lengthwise ; stamens with 1-9 pollen-sacs . . . 3
3. Perianth present **Gnetaceæ** 4
 Perianth absent 4
4. Seeds overtopping the fleshy or rudimentary carpels and surrounded by a fleshy aril ; carpels with 1 ovule **Taxaceæ**
 Seeds concealed between the carpels, without an aril ; carpels usually with 2 or more ovules **Pinaceæ**
5. Embryo with one cotyledon ; vascular bundles scattered in the stem ; leaves usually parallel-veined ; flowers usually 3-merous 6
 Embryo with 2 cotyledons, rarely with only one well developed cotyledon, or undivided ; vascular bundles nearly always arranged in a cylinder ; leaves usually net-veined ; flowers usually 4- or 5-merous 48
6. Perianth glumaceous, or represented by linear scales, or absent . 7
 Perianth petal- or sepal-like, or differentiated into a calyx and corolla 18
7. Aquatic or marsh plants, with long erect stems (4 ft. or more) ; leaves strap-shaped ; inflorescence cylindric, compact, bearing unisexual flowers **Typhaceæ**
 Terrestrial, aquatic, or marsh plants ; inflorescence various but never a long dense cylindric spike 8
8. Perianth glumaceous, of 6 segments in 2 rows, or flowers in the axis of a bract (*valve*), usually subtended by another bract (*pale*) and usually surrounded by 2 outer bracts (*glumes*) 9
 Perianth 0, rarely represented by linear scales 11
9. Perianth of 6 segments in 2 rows ; stems solid ; leaf-sheaths when present without a ligule 10
 Flower surrounded by bracts (*valve*, *pale*, *glumes*) ; stems invariably hollow ; leaf-sheath usually split and ending in a ligule **Gramineæ**
10. Flowers bisexual ; stamens usually 6 ; ovules 2 or more in each ovary-chamber **Juncaceæ**
 Flowers unisexual ; stamens 3 ; ovule solitary in each ovary-chamber **Restionaceæ**
11. Flowers on a cylindric fleshy spadix, surrounded by a large trumpet-shaped petaloid spathe **Araceæ**
 Flowers various, if on a spadix and surrounded by a spathe, then aquatic plants with leaves in a rosette 12
12. Aquatic plants, either free-floating, or submerged, or with the leaves floating 13
 Terrestrial or marsh plants, sometimes found growing in water but then the leaves never opposite and the ovary 1-chambered with a single ovule **Cyperaceæ**
13. Free-floating plants represented by a thallus (not differentiated into stem and leaves) : flowers very minute, situated in cavities on the thallus **Lemnaceæ**
 Plants differentiated into stem and leaves 14
14. Gynæcium of 3-8 free carpels, or if of 1 carpel, then the ovule solitary ; leaves opposite or alternate 15
 Ovary 1-chambered, with numerous basal ovules ; leaves in a rosette **Araceæ**

15. Flowers unisexual; stamen 1; carpels 1-4 16
- Flowers bisexual; stamens 2-6 or more; carpels 3-8 17
16. Stamen enclosed in a bottle-shaped spathe **Naiadaceæ**
- Stamens naked **Potamogetonaceæ**
17. Leaves with a stipule-like sheath; stamens 2 **Potamogetonaceæ**
- Leaves without a stipule-like sheath; stamens 5-6 or more **Aponogetonaceæ**
18. Flowers bisexual 19
- Flowers unisexual 40
19. Ovary superior 20
- Ovary inferior or half-inferior 32
20. Aquatic plants with floating or submerged leaves 21
- Terrestrial plants, sometimes found in damp or marshy places 23
21. Perianth-segments 6, in 2 rows of 3 each; stamens 3; ovary 1-chambered; ovules many **Mayaceæ**
- Perianth-segments 1-4; stamens 4-6; gynæcium usually of free carpels, if of 1 carpel only then ovule solitary 22
22. Perianth of 4 green segments; stamens 4; ovule solitary in each carpel **Potamogetonaceæ**
- Perianth of 1-3 equal or unequal segments; stamens 5-6 or more; ovules basal, 2-8 in each carpel **Aponogetonaceæ**
23. Gynæcium of 3 almost free carpels; fruit elongated, cylindric and 3-lobed at the apex, or the carpels breaking away from a 3-winged axis **Juncaginaceæ**
- Ovary 1-chambered with 3 parietal placentas, or 2-3-chambered (gynæcium never of almost free carpels); fruit a capsule or berry, never with 3 recurved apical lobes, very rarely with spreading lobes, but then perianth-segments with an auricle on the face 24
24. Fertile stamens 2-3, sometimes 3-4 barren stamens present 25
- Fertile stamens 6, rarely 5 but then the ovary 2-chambered 30
25. Ovary 2-3-chambered, sometimes 2 of the chambers without ovules 26
- Ovary 1-chambered 28
26. Stamens 6, but only 2-3 fertile 27
- Stamens 3, all fertile **Hæmadoraceæ**
27. Petals distinctly clawed; leaves cauline; rootstock not a bulb **Commelinaceæ**
- Petals not distinctly clawed; leaves radical; rootstock a bulb **Liliaceæ**
28. Perianth differentiated into an evident calyx and corolla **Xyridaceæ**
- Perianth of 6 similar segments 29
29. Perianth-segments united to form a distinct tube **Pontederiaceæ**
- Perianth-segments free or almost so **Commelinaceæ**
30. Perianth distinctly petaloid or differentiated into a calyx and corolla; leaves rarely tendril-tipped but if so then flowers not in a panicle and leaves rarely sheathing at the base 31
- Perianth sub-petaloid or herbaceous, deciduous; climbing plants with tendril-tipped leaves sheathing at the base **Flagellariaceæ**
31. Perianth not differentiated into a calyx and corolla **Liliaceæ**
- Perianth differentiated into a calyx and corolla **Commelinaceæ**
32. Ovary 1-chambered; ovules numerous, minute **Orchidaceæ**
- Ovary 3-chambered or 6-chambered; ovules 1 to many in each ovary-chamber 33
33. Fertile stamen 1 **Zingiberaceæ**
- Fertile stamens 3, 5, or 6, very rarely 12-18 34
34. Stamens 5; seeds with an aril of golden woolly hairs **Musaceæ**
- Stamens 3 or 6, rarely 12-18 35
35. Stamens normally 6, sometimes 12-18 36
- Stamens 3 38
36. An aquatic herb **Hydrocharitaceæ**
- Terrestrial plants 35

37. Plants with woody, often branched, stems; leaves crowded at the apex of the stems **Velloziaceæ**
Usually acaulescent plants; rootstock a bulb or corm, never with woody stems **Amaryllidaceæ**
38. Perianth-tube prominently 3-angled or 3-winged; connective of anther produced at the apex into an entire or 2-partite crest **Burmanniaceæ**
Perianth-tube not prominently angled or winged; anthers not crested 39
39. Stamens opposite the outer perianth-segments; perianth-segments usually joined to form a tube, if free then the style-branches deeply forked, crested, or petaloid, or rush-like leafless plants, or perianth-segment narrowed into a filiform apex and the ovary with 2-3 ovules in each chamber **Iridaceæ**
Stamens opposite the inner perianth-segments; perianth-segments free and then peduncle hairy, or if joined to form a short tube then several 1-flowered peduncles to each corm and segments yellow and tipped with green **Hæmodoraceæ**
40. Ovary superior or gynæcium of free carpels 41
Ovary inferior 45
41. Flowers arranged on a cylindric spadix; the female below; the male above; the whole surrounded by a spathe **Araceæ**
Flowers arranged in a spike, panicle, head, or umbel, if enclosed in a large bract then male and female flowers never on a cylindric spadix 42
42. Large or small trees, with large palmate pinnatisect or pinnate leaves **Palmae**
Herbaceous plants, often found in water or marshes 43
43. Leaves with a pair of spiral tendrils at the base of the petiole; flowers in an umbel **Liliaceæ**
Aquatic or marsh plants; leaves without tendrils; flowers in heads or panicles 44
44. Carpels free; leaves petioled; flowers in panicles **Alismataceæ**
Ovary 2-3-chambered; leaves not petioled; flowers in heads **Eriocaulaceæ**
45. Aquatic herbs, often with whorled leaves; flowers enclosed in a spathe **Hydrocharitaceæ**
Terrestrial plants; rootstock a rhizome or tuber 46
46. Calyx long-tubular, 3-5-lobed, slit down one side; petal 1, small, opposite the slit side of the calyx **Musaceæ**
Perianth gamosepalous or free, not as above 47
47. Flowers in spikes or racemes **Dioscoreaceæ**
Male and female flowers on a cylindric spadix and surrounded by a spathe **Araceæ**
- 48.* Flowers unisexual, rarely male flowers of a single stamen and female flowers of a single gynæcium grouped in a head to resemble a bisexual flower, but then juice usually milky 49
Flowers bisexual, if apparently female owing to stamens being minute and not readily seen, then flowers in globose axillary glomerules and each flower subtended by a fleshy bract 194
49. Trees, shrubs, or herbs, not aquatic nor root parasites 50
Aquatic herbs, or almost leafless root-parasites 189
50. Leaves pinnately or digitately compound, or leaves 3-foliate 51
Leaves simple or sometimes absent 89
51. Leaves pinnately compound 52
Leaves digitately compound or leaves 3-foliate 77
52. One perianth whorl present 53
Calyx and corolla present 54

* While families with unisexual genera have been grouped together they are also all included in the section of the Key under bisexual flowers, *i.e.*, beginning at section 194.

53. Leaves simply pinnate **Rosaceæ**
 Leaves bipinnate **Leguminosæ**
54. Plants furnished with tendrils; fruit a gourd or berry **Cucurbitaceæ**
 Plants without, rarely with tendrils, but if so then the fruit a bladdery capsule 55
55. Petals free 56
 Petals joined **Leguminosæ**
56. Leaves opposite **Zygophyllaceæ**
 Leaves alternate 57
57. Flowers in a compound umbel **Umbelliferæ**
 Flowers not in a compound umbel 58
58. Leaves bipinnate 59
 Leaves simply pinnate 60
59. Trees; fruit a pod **Leguminosæ**
 Sub-herbaceous climbers; fruit a bladdery capsule **Sapindaceæ**
60. Flowers male 61
 Flowers female 71
61. Stamens as many as the petals 62
 Stamens more than the number of petals 66
62. Filaments connate **Melanthaceæ**
 Filaments free 63
63. Trees with spiny branches **Rutaceæ**
 Trees or shrubs without spines 64
64. Leaf-rhachis winged; 5 glandular scales within the calyx **Anacardiaceæ**
 Leaf-rhachis not winged, if narrowly winged then the leaflets unequal sided; calyx without scales 65
65. Leaflets not distinctly unequal sided **Simarubaceæ**
 Leaflets distinctly unequal sided **Meliaceæ**
66. Filaments connate 67
 Filaments free 68
67. Trees; fruit a dry berry **Meliaceæ**
 Sub-herbaceous climbing plants; fruit a bladdery capsule **Sapindaceæ**
68. Calyx urceolate or tubular, 4-toothed **Burseraceæ**
 Calyx deeply lobed or sepals free 69
69. Stamens twice as many as the petals **Anacardiaceæ**
 Stamens more than twice as many as the petals, or stamens 8 and petals 5 70
70. Leaves crowded at the apex of the branches **Anacardiaceæ**
 Leaves not crowded at the apex of the branches **Sapindaceæ**
71. Calyx urceolate or tubular, 4-toothed **Burseraceæ**
 Calyx deeply 4-6-lobed, or sepals free 72
72. Leaf-rhachis winged; 5 glandular scales within the calyx **Anacardiaceæ**
 Leaf-rhachis not winged; calyx without glandular scales 73
73. Trees with thorny branches **Rutaceæ**
 Branches without thorns 74
74. Styles free or almost so 75
 Styles simple 76
75. Leaves crowded at the ends of the branches; leaflets numerous; flowers in axillary cymose corymbs **Simarubaceæ**
 Leaves rarely crowded at the apex of the branches, but if so then the leaflets distant or flowers in spikes, racemes, or panicles **Anacardiaceæ**
76. Flowers in lax panicles; ovary 4-5-chambered **Meliaceæ**
 Flowers in racemes, often compact, or in densely flowered panicles; ovary 1-3-chambered **Sapindaceæ**
77. One perianth whorl present 78
 Calyx and corolla present 82

78. Leaves usually 5-11-parted, if only 3-parted then stamens 5 and ovary
1-chambered with one ovule **Moraceæ**
Leaves 3-foliate, if more than stamens 8 or more, or ovary more
than 1-chambered 79
79. Flowers sessile in the axils of the leaves, solitary or 2-nate, rarely
on long pedicels; stipules adnate to the petiole . . . **Rosaceæ**
Flowers in axillary racemes, or panicles, or in heads surrounded by
bracts; stipules when present not adnate to the petiole . . . 80
80. Flowers in small heads on long peduncles, surrounded by leafy
bracts **Euphorbiaceæ**
Flowers in racemes or panicles 81
81. Stamens 8, free; ovary 2-chambered **Sapindaceæ**
Stamens 10-15, connate; gynæcium of 5 sub-distinct carpels **Sterculiaceæ**
82. Plants furnished with tendrils 83
Plants without tendrils 86
83. Ovary inferior **Cucurbitaceæ**
Ovary superior 84
84. Petiole with 2 glands at the apex **Passifloraceæ**
Petiole without glands 85
85. Stamens free, as many as the petals; fruit a berry . . . **Vitaceæ**
Stamens connate at the base, twice as many as the petals; fruit
a bladdery capsule **Sapindaceæ**
86. Flowers in umbels **Umbellifereæ**
Flowers in racemes, spikes, or panicles 87
87. Leaves with sunken pellucid glands **Rutaceæ**
Leaves without pellucid glands 88
88. Stamens as many as the petals; ovary 1-chambered **Anacardiaceæ**
Stamens twice as many as the petals; ovary 1-chambered
Sapindaceæ
89. Perianth 0, sometimes only absent in one sex 90
Perianth present, simple, or consisting of a calyx and corolla . . . 96
90. Flowers in a small head surrounded by bracts; the central flowers
female; the marginal flowers male; all embedded in wool
Urticaceæ
Flowers rarely in a head, but if so then not embedded in wool . . . 91
91. Plants with milky juice, or trees with succulent branches
Euphorbiaceæ
Plants without milky juice, if fleshy then herbs 92
92. Leaves opposite **Myrothamnaceæ**
Leaves alternate or 0, rarely opposite, but if so then shrubs with
ashy-grey leaves 93
93. Herbs; branches jointed at the nodes; inflorescence a cylindric
spike **Piperaceæ**
Small trees or shrubs, rarely herbs, but then leaves ashy-grey . . . 94
94. Male flowers with a perianth; female flowers with a 1-chambered
ovary and a solitary ovule **Chenopodiaceæ**
Perianth absent in both sexes; ovary 1-chambered, with many
ovules, or ovule solitary 95
95. Leaves stipulate; ovules many **Salicaceæ**
Leaves exstipulate; ovule solitary **Myricaceæ**
96. One perianth whorl present 97
Perianth consisting of a calyx and corolla, sometimes the female
flowers massed in the axil of a bract and consisting of 1 sepal,
1 petal, and 1 carpel 144
97. Plants with milky juice, or trees with fleshy stems . . . **Euphorbiaceæ**
Plants without milky juice; if fleshy then herbs 98
98. Perianth-segments free 99
Perianth joined 112
99. Base of petiole dilated into a membranous sheath, often fringed
with bristles **Polygonaceæ**
Base of petiole not dilated into a membranous sheath 100

100. Perianth-segments glumaceous **Amarantaceæ**
 Perianth-segments herbaceous, more rarely somewhat leathery 101
101. Perianth-segments unequal; two larger than the others; herbaceous plants with fleshy stems **Begoniaceæ**
 Perianth-segments equal or sub-equal; plants if herbaceous not with fleshy stems 102
102. Stipules present, if absent then herbs covered with more or less prehensile hooked hairs 103
 Stipules 0 107
103. Stipules adnate to the petiole **Rosaceæ**
 Stipules free or connate, but not adnate to the petiole 104
104. Disc usually present in the flower, if absent then stamens rarely of the same number as the perianth-segments; ovary 2- or more-chambered, very rarely 1-chambered, but if so then ovules 2
Euphorbiaceæ 5
- Disc absent; stamens as many as the perianth-segments; ovary 1-chambered, if 2-3-chambered then flowers not in axillary cymes or clusters or solitary 105
105. Filaments broadened at the base, bent inwards in the bud; ovule erect or ascending **Urticaceæ** 1. 127
 Filaments straight in the bud; ovules pendulous 106
106. Flowers in small axillary cymes or clusters, or solitary. . . **Ulmaceæ**
 Flowers in axillary panicles about half as long as the leaves
Euphorbiaceæ
107. Stamens 4, attached to the perianth-segments; ovary 1-chambered
Proteaceæ
 Stamens free from the perianth-segments, sometimes connate at the base; ovary 2- or more-chambered or gynæcium of free carpels, rarely ovary 1-chambered, but if so then stamens many and fruit a berry 108
108. Gynæcium of free carpels **Phytolaccaceæ**
 Gynæcium of fused carpels, ovary 2-6-chambered rarely 1-chambered 109
109. Fruit armed with spines **Aizoaceæ**
 Fruit not armed with spines 110
110. Fruit a berry **Flacourtiaceæ**
 Fruit of separate carpels or a capsule 111
111. Fruit of 1 or 2 dry leathery carpels or a winged capsule **Sapindaceæ**
 Fruit a 2-3-valved capsule **Euphorbiaceæ** 2
112. Petioles expanded into membranous sheaths sometimes bristly at the apex **Polygonaceæ**
 Petioles not expanded into membranous sheaths 113
113. Anthers attached at the back to the perianth-segments by a tuft of hairs; ovary inferior, 1-chambered, with 2-3 pendulous ovules
Santalaceæ 1. 128
 Anthers not attached to the perianth by a tuft of hairs; ovary superior, if inferior or 1- or 2-chambered then ovules solitary or fruit winged 114
114. Leaves gland-dotted **Rutaceæ**
 Leaves not gland-dotted 115
115. Leaves stipulate 116
 Stipules absent 120
116. Stipules adnate to the petiole **Rosaceæ**
 Stipules free or connate but not adnate to the petiole 117
117. Ovary inferior **Hamamelidaceæ**
 Ovary superior 118
118. Plants with milky juice; fruit a fig **Moraceæ** 1. 129
 Plants without milky juice, but if so then fruit a capsule 119
119. Disc usually present in the flowers; stamens rarely the same number as the perianth-lobes; filaments sometimes connate; fruit a 2-3-valved capsule sometimes flattened and winged
Euphorbiaceæ

159. Stamens numerous; ovary 2—3-chambered; ovule solitary
 Guttiferae
 Stamens as many as the petals; ovary 2-chambered, with 1—3 ovules
 in each chamber, if 3-chambered with 1 ovule in each chamber, then
 leaves closely pinnatinerved 160
160. Leaves closely pinnatinerved **Anacardiaceae**
 Leaves not closely pinnatinerved **Salvadoraceae**
161. Sepals 3; petals 6; stamens numerous; carpels free **Annonaceae**
 Sepals and petals usually 4—5, if more or less, than stamens not
 numerous (rarely sepals 3, petals 10, and stamens numerous or carpels
 rarely free but, if so, then sepals 6) 162
162. Flowers male 163
 Flowers female 175
163. Prostrate or semi-erect herbs, sometimes woody at the base
 Phytolaccaceae
 Trees or tall shrubs 164
164. Stamens as many as the petals 165
 Stamens more or less than the number of the petals 169
165. Stamens opposite the petals... .. 166
 Stamens alternating with the petals 168
166. Flowers with a disc 167
 Disc absent **Menispermaceae**
167. Inflorescence a spike, raceme, or panicle **Anacardiaceae**
 Flowers solitary or fascicled... .. **Euphorbiaceae**
168. Filaments free... .. **Saxifragaceae**
 Filaments connate **Meliaceae**
169. Stamens less than the number of petals **Menispermaceae**
 Stamens more than the number of petals 170
170. Filaments connate 171
 Filaments free... .. 172
171. Filaments connate among themselves and with the stalked receptacle
 Anacardiaceae
 Filaments connate in bundles **Flacourtiaceae**
172. Stamens 5—10 173
 Stamens many, if only 8—10, then petals with a fleshy gland at the base
 inside **Flacourtiaceae**
173. Sepals free or almost so, if calyx small and cupular, then the petals
 minute and villous within, or leaves covered with lepidote scales ... 174
 Calyx urceolate or tubular, 4-toothed **Burseraceae**
174. Flowers in axillary glomules or fascicles or twigs covered with lepidote
 scales or stellate hairs **Euphorbiaceae**
 Flowers in simple or paniced racemes **Sapindaceae**
175. Ovary 2- or more-chambered or gynaecium of 3—4 free carpels ... 176
 Ovary 1-chambered 182
176. Ovules many in each ovary-chamber **Saxifragaceae**
 Ovule 1 or ovules 2 or few in each ovary-chamber or carpel 177

[illegible]

168. Sepals free or almost so, if calyx small and cupular then the petals
minute and villous within, or leaves covered with lepidote scales 169
Calyx urceolate or tubular, 4-toothed **Burseraceæ**
169. Flowers in axillary glomerules or fascicles, or twigs covered with
scales or stellate hairs **Euphorbiaceæ**
Flowers in simple or paniced racemes **Sapindaceæ**
170. Ovary 2- or more-chambered, or gynæcium of 3-4 free carpels 171
Ovary 1-chambered 177
171. Ovules many in each ovary-chamber **Saxifragaceæ**
Ovule solitary, or ovules 2 or few in each ovary-chamber or carpel 172
172. Ovule solitary 173
Ovules 2 or few 175
173. Gynæcium of 3-4 free carpels **Menispermaceæ**
Gynæcium of fused carpels 174
174. Flowers in simple or laxly paniced racemes **Sapindaceæ**
Flowers in very dense terminal panicles **Anacardiaceæ**
175. Ovules 3 or more **Flacourtiaceæ**
Ovules 2 176
176. Ovary 2-3-chambered; stigma obtusely 4-lobed **Burseraceæ**
Ovary 4-20 chambered; stigma simple, discoid or capitate **Meliaceæ**
177. Ovules 3 or more **Flacourtiaceæ**
Ovule solitary 178
178. Sepals 2 or 1 179
Sepals 4-5 **Anacardiaceæ**
179. Petals 2 or 1 **Menispermaceæ**
Petals 4-5 **Portulacaceæ**
180. Plants furnished with tendrils **Vitaceæ**
Plants without tendrils 181
181. Petiole armed at the base with a dorsal spur-like spine
Petiole without a dorsal spine **Menispermaceæ**
182. Leaves opposite 183
Leaves alternate or radical 185
183. Trees or shrubs **Ebenaceæ**
Herbaceous plants or small undershrubs 184
184. Stipules adnate to the petiole or similar to the leaves so that the
leaves appear whorled **Rubiaceæ**
Stipules absent **Labiataæ**
185. Herbaceous plants or small undershrubs 186
Trees or large shrubs, sometimes twiners 187
186. Flowers solitary or 2-nate **Arachiaceæ**
Flowers in a dense cylindric spike **Plantaginaceæ**
187. Petals joined to form a broad entire saucer-shaped corolla
Petals not forming a saucer-shaped corolla; corolla distinctly lobed 188
188. Ovules 1-2 in each ovary-chamber **Ebenaceæ**
Ovules 4-5 **Myrsinaceæ**
189. Aquatic herbs 190
Leafless or almost leafless root-parasites 193
190. Leaves whorled 191
Leaves opposite or more or less radical 192
191. Flowers axillary, solitary **Ceratophyllaceæ**
Flowers spicate at the ends of the branches **Halorrhagidaceæ**
192. Flowers minute, axillary, solitary **Callitrichaceæ**
Flowers in a spike **Hydrostachyaceæ**
193. Stamens 2-3; ovules 1-3, pendulous **Balanophoraceæ**
Stamens 8-10; ovules numerous **Rafflesiaceæ**
194. Stamens 6, united in 2 bundles of 3 each; corolla irregular; herbs
with much cut or compound leaves, mostly with tendrils
Stamens various but not connate into 2 bundles of 3 each **Fumariaceæ** 195

195. Leaves opposite or whorled 196
 Leaves alternate, radical, or none 384
196. Leaves simple 197
 Leaves compound 363
197. Flowers with 1 perianth-whorl or perianth absent 198
 Flowers with a calyx and corolla 245
198. Perianth-segments when present free 199
 Perianth segments joined 213
199. Ovary superior 200
 Ovary inferior 212
200. Both perianth-whorls absent at least in the female flowers 201
 One perianth-whorl present 204
201. Plants with fan-like leaves; ovary 3-chambered, with numerous
 ovules in each chamber **Myrothamnaceæ**
 Leaves not fan-like; ovary 1-chambered or 4-chambered, with a single
 ovule in each chamber 202
202. Flowers in heads joined together by glutinous hairs, the whole
 surrounded by an involucre of bracts **Urticaceæ**
 Flowers not in heads surrounded by an involucre of bracts 203
203. Ovary 4-chambered; stamen 1 **Callitrichaceæ**
 Ovary 1-chambered; stamens 2 **Piperaceæ**
204. Leaves in whorls of 6; a large shrub or small tree, with bisexual
 flowers **Proteaceæ**
 Leaves opposite, if whorled then plants herbaceous, or sub-woody
 undershrubs, or flowers unisexual 205
205. Ovules 3 or more in each ovary-chamber 206
 Ovule solitary or ovules 2 in each ovary-chamber 207
206. Staminodes (petals?) many, connate at the base, shorter than the
 sepals, or stamens many, or leaves whorled, but if so then stipules
 not large membranous and connate, but leaves sometimes
 expanded into a membranous sheath **Aizoaceæ**
 Staminodes if present not many; leaves opposite, if in false whorls
 then stipules large membranous and connate **Caryophyllaceæ**
207. Flowers unisexual 208
 Flowers bisexual, but sterile flowers sometimes present 210
208. Stamens 6 **Buxaceæ**
 Stamens 5 or many 209
209. Ovule basal **Phytolaccaceæ**
 Ovule or ovules pendulous **Euphorbiaceæ**
210. Perianth-segments 5 211
 Perianth-segments 4 **Geissolomaceæ**
211. Perianth membranous, shining; ovule suspended from a basal
 funicle **Amarantaceæ**
 Perianth herbaceous; ovule sessile or sub-sessile **Phytolaccaceæ**
212. Stem parasites; flowers unisexual **Loranthaceæ**
 Non-parasitic plants; flowers bisexual **Onocharaceæ**
213. Ovary superior 214
 Ovary inferior 239
214. Aquatic plants with whorled leaves **Ceratophyllaceæ**
 Herbs, shrubs, or trees, not water plants; leaves usually opposite,
 sometimes whorled 215
215. Petiole expanded into a membranous sheath **Aizoaceæ**
 Petiole not expanded into a membranous sheath 216
216. Ovary 1-chambered 217
 Ovary 2-5- (rarely 10-) chambered 232
217. Ovules many **Lythraceæ**
 Ovule solitary, more rarely ovules 2 218
218. Small undershrubs; leaves linear; flowers in glomerules in the leaf
 axils, each subtended by a fleshy bract; calyx-tube fleshy;
 stamens hardly visible **Caryophyllaceæ**
 Flowers not subtended by fleshy bracts; calyx-tube not fleshy 219

219. Filaments connate at the base 220
 Filaments free 221
220. Perianth glumaceous **Amarantaceæ**
 Perianth herbaceous, coloured **Nyctaginaceæ**
221. Stamens 10-15; shrubs or small trees 222
 Stamens 1-5; rarely 8-10, but if so then herbs or styles 2; style
 rarely absent, but if so then flowers unisexual 223
222. Style none; stigma sessile **Monimiaceæ**
 Style long, filiform **Thymelæaceæ**
223. Stamens in 4 whorls; perianth-segments 6 **Lauraceæ**
 Stamens in 1 whorl, sometimes filaments of unequal lengths and
 then stamens appearing as if in 2 whorls; perianth-segments 3-5 224
224. Flowers bisexual 225
 Flowers unisexual 230
225. Stigmas 2-3 226
 Style simple; stigmas not free to the base 228
226. Leaves connate at the base, or stipules membranous **Caryophyllaceæ**
 Leaves not connate at the base; stipules 0 227
227. Stamens as many as the perianth-lobes **Chenopodiaceæ**
 Stamens twice as many as the perianth-lobes **Aizoaceæ** p. 231
228. Woody plants, with tough bark **Thymelæaceæ**
 Herbaceous plants, rarely shrubby at the base 229
229. Stipules present, rarely absent, but if so then leaves not pungent
 Stipules absent; leaves very pungent **Caryophyllaceæ** p. 231
 Stipules absent **Chenopodiaceæ**
 Stipules present 231
231. Fruit a capsule or utricle enclosed in the perianth **Caryophyllaceæ**
 Fruit a small achene **Urticaceæ**
232. Ovary 10-chambered **Zygophyllaceæ** p. 235
 Ovary 2-5-chambered 233
233. Leaves whorled **Aizoaceæ** p. 231
 Leaves opposite 234
234. Flowers unisexual 235
 Flowers bisexual, more rarely unisexual with occasional bisexual
 flowers, but then fruit, a fleshy drupe 237
235. Perianth-segments 4 in the male; 4-6 in the female **Buxaceæ**
 Perianth-segments 3 or 5 in both sexes 236
236. Fruit a densely tomentose 2-valved capsule **Hamamelidaceæ**
 Fruit normally a 3-dymous capsule breaking up into 2-valved cocci
 **Euphorbiaceæ**
237. Herbs or small undershrubs; styles free **Aizoaceæ**
 Rigid shrubs or small trees; style simple, if free then fruit a drupe 238
238. Ovule solitary in each ovary-chamber; fruit a drupe **Rhamnaceæ**
 Ovules 2 or 4 in each ovary-chamber; fruit a capsule **Penæaceæ** p.
239. Flowers unisexual 240
 Flowers bisexual, if unisexual with occasional bisexual flowers then
 stamens twice as many as the perianth-lobes 241
240. Stamens inserted near the base of the perianth-segments; ovary
 1-chambered, with 2-4 pendulous ovules; style simple **Santalaceæ**
 Stamens hypogynous; ovary 2-chambered, with a solitary ovule
 in each chamber; styles 2, free **Hamamelidaceæ**
241. Anthers connate round the style; flowers in heads surrounded
 by an involucre of bracts **Compositæ**
 Anthers free; flowers not grouped in heads, rarely flowers 3-nate
 and surrounded by a few bracts, but then leaves ericoid 242
242. Ovule solitary **Lauraceæ**
 Ovules 2 or more 243
243. Anthers attached to the perianth-segments by a tuft of hairs
 **Santalaceæ**
 Anthers not attached to the perianth-segments by a tuft of hairs 244

244. Fruit winged ; flowers not minute, nor grouped, nor sessile in the leaf axils **Combretaceæ**
 Fruit not winged ; flowers minute, grouped and sessile in the leaf-axils **Grubbiaceæ**
245. Petals free 246
 Petals joined, at least at the base 306
246. Ovary superior 247
 Ovary inferior 292
247. Flowers unisexual 248
 Flowers bisexual 251
248. Sepals 2 **Portulacaceæ**
 Sepals 4-6 249
249. Styles free ; sepals 4-6 250
 Stigma sessile, peltate ; sepals 4, in two opposite pairs . . . **Guttiferæ**
250. Ovary 2-chambered ; styles 2 **Hamamelidaceæ**
 Ovary usually 3- (more rarely 2- or 4-) chambered ; styles usually 3 **Euphorbiaceæ**
251. Sepals 2 252
 Sepals or calyx-lobes 3-6 253
252. Flower irregular **Papaveraceæ**
 Flower regular or nearly so **Portulacaceæ**
253. Ovule solitary in each ovary-chamber 254
 Ovules 2 or more in each ovary-chamber 258
254. Stamens indefinite **Guttiferæ**
 Stamens 4-10 255
255. Stamens 10 ; fruit winged **Malpighiaceæ** 250
 Stamens 4-8 ; fruit not winged 256
256. Petals inserted in the throat of the calyx-tube . . . **Thymelæaceæ**
 Petals free from the calyx 257
257. Leaves closely and distinctly pinnately veined . . . **Anacardiaceæ**
 Leaves not closely pinnately veined **Rhamnaceæ** 250
258. Perianth with a corona **Asclepiadaceæ** 250
 Perianth without a corona 259
259. Gynæcium of free carpels **Crassulaceæ**
 Gynæcium of fused carpels, if carpels almost free then aromatic shrubs with gland-dotted leaves ; ovary sometimes 1-chambered 260
260. Flower distinctly irregular 261
 Flower regular or almost so 262
261. Ovary 5-chambered **Balsaminaceæ**
 Ovary 1-chambered **Violaceæ**
262. Ovary 5- (rarely more-) chambered 263
 Ovary 1-4-chambered 272
263. Styles free or almost so 264
 Style simple or adnate to a central column from which the styles separate on maturity 266
264. Stamens indefinite **Guttiferæ**
 Stamens as many or twice as many as the petals 265
265. Stamens as many as the petals **Linaceæ**
 Stamens twice as many as the petals **Elatinaceæ**
266. Ovules 2 in each ovary-chamber 267
 Ovules many in each ovary-chamber 269
267. Small aromatic shrubs with gland-dotted leaves, or a large tree with a tuberculed ovary on a long stalk **Rutaceæ**
 Herbs or shrubs, if aromatic then leaves not gland-dotted . . . 268
268. Usually herbaceous plants ; fruit at maturity splitting into separate carpels **Geraniaceæ**
 Usually woody plants ; fruit usually a winged capsule, sometimes separating into carpels but not from a central axis . . . **Zygophyllaceæ** 250
269. Stamens indefinite **Guttiferæ**
 Stamens definite 270

270. Stamens free from the calyx; filaments with an entire or 2-partite scale at the base **Zygophyllaceæ** p. 346
 Stamens inserted in the calyx-tube; filaments without scales . . . 271
271. Leaves with 3-5 nerves from the base; connective of anthers elongated, with an appendage or spur in front . . **Melastomaceæ** p. 439
 Leaves not distinctly nerved from the base; connective not elongated and spurred **Lythraceæ** p. 441
272. Ovules 2 in each ovary-chamber 273
 Ovules 3 or more in each ovary-chamber, more rarely ovule solitary 278
273. Stamens more than the number of petals 274
 Stamens as many as or less than the number of petals 276
274. Ovary 1-chambered **Flacourtiaceæ**
 Ovary 2- or more-chambered 275
275. Fruit a winged or deeply ribbed capsule **Zygophyllaceæ** p. 346
 Fruit fleshy, indehiscent **Rhizophoraceæ**
276. Stamens normally 3, mostly 2 or 4, if stamens 5 then 2 or 3 without anthers **Hippocrateaceæ** p. 367
 Fertile stamens 5 277
277. Small aromatic shrubs, with gland-dotted leaves **Rutaceæ**
 Shrubs, not aromatic; leaves not gland-dotted **Celastraceæ**
278. Stamens indefinite, or 4-5 times as many as the number of petals . 279
 Stamens definite, sometimes 2-3 times as many as the number of petals 280
279. Calyx 5-partite; petals margined with black dots **Guttiferæ**
 Calyx-tube campanulate, funnel-shaped, or urceolate; petals not margined with black dots **Myrtaceæ** p. 346
280. Fruit a silique; valves breaking away from a membranous partition which bears the seeds **Crucifereæ**
 Fruit a valved capsule, more rarely fruit fleshy or separating into carpels 281
281. Petals inserted in the calyx-throat and alternating with the calyx-lobes **Lythraceæ**
 Petals hypogynous or nearly so, free from the calyx 282
282. Ovary 1-chambered 283
 Ovary 2- or more-chambered 286
283. Ovules on long funicles; stipules 0 **Frankeniaceæ** p. 347
 Ovules sessile or sub-sessile, if on short funicles then stipules present 284
284. Herbaceous plants, if somewhat woody then calyx-tube long tubular and bracteate at the base **Caryophyllaceæ** p. 348
 Woody plants 285
285. Ovary surrounded at the base by a fleshy crenate disc **Celastraceæ** p. 366
 Disc absent **Violaceæ**
286. Ovule solitary **Scrophulariaceæ** p. 351
 Ovules 2 or more 287
287. Stamens less than the number of petals 288
 Stamens as many as or more than the number of petals 290
288. Ovary 1-chambered, if incompletely 2-3-chambered then styles free **Caryophyllaceæ**
 Ovary 2-3-chambered 289
289. Stamens usually 3; ovules 2-10 in each ovary-chamber **Hippocrateaceæ** p. 367
 Stamens 2 or 4; ovules numerous in each ovary-chamber **Scrophulariaceæ** p. 351
290. Herbaceous plants **Caryophyllaceæ** p. 348
 Woody plants 291
291. Stamens twice as many as the number of petals **Zygophyllaceæ** p. 346
 Stamens as many as, or more than the number of petals, but not twice as many **Myrtaceæ** p. 346
292. Stem parasites; ovules hardly differentiated from the placenta **Loranthaceæ**
 Non-parasitic plants; ovules distinct 293

293. Ovary 1-chambered 294
 Ovary 2- or more-chambered 298
294. Style simple 295
 Styles free 296
295. Fruit winged **Combretaceæ**
 Fruit not winged **Melastomaceæ**
296. Flowers bisexual **Saxifragaceæ**
 Flowers unisexual 297
297. Flowers 4-merous; herbs or aquatic plants . . . **Halorrhagidaceæ**
 Flowers 5-merous; trees or shrubs **Hamamelidaceæ**
298. Petals indefinite; succulent plants **Aizoaceæ** p. 22
 Petals 3-5; herbs, shrubs, or trees, not succulent 299
299. Stamens indefinite **Myrtaceæ**
 Stamens 3-12 300
300. Leaves with 3-11 longitudinal nerves **Melastomataceæ**
 Leaves not longitudinally nerved 301
301. Herbaceous plants **Oenotheraceæ**
 Trees or shrubs 302
302. Stamens 4-5 303
 Stamens 8-10 **Rhizophoraceæ** p. 24
303. Undersurface of leaves and young branches covered with stellate hairs **Hamamelidaceæ**
 Plants without stellate hairs 304
304. Petals linear-clavate, with revolute margins, much longer than the sepals; styles 2 **Hamamelidaceæ**
 Margins of petals not revolute; style simple 305
305. Leaves entire; ovules more than 1 in each ovary-chamber . . **Olinaceæ** p. 25
 Leaves coarsely toothed; ovule solitary in each ovary-chamber **Cornaceæ**
306. Ovary superior 307
 Ovary inferior 356
307. Petals many, joined at the base **Aizoaceæ** p. 21
 Corolla usually 4- or 5-lobed, sometimes 2-lipped, more rarely 3-lobed or 7-16-lobed, but if so then styles never free 308
308. Ovary 1-chambered 309
 Ovary 2- or more-chambered, or gynæcium of 2 or more free carpels 318
309. Stamens not inserted on the corolla-tube, or adnate to the corolla at the base only 310
 Stamens inserted on the corolla-tube or in the corolla-throat 314
310. Stamens twice as many as the corolla-lobes; leaves usually ericoid **Ericaceæ** p. 20
 Stamens as many as or less than the number of the corolla-lobes; leaves very rarely ericoid 311
311. Small shrubs with ericoid leaves; anthers deeply bipartite, or stigma peltate or crater-shaped **Ericaceæ**
 Herbs or shrubs; leaves not ericoid; anthers not deeply bipartite 312
312. Sepals 2 **Portulacaceæ**
 Sepals more than 2 313
313. Herbs **Caryophyllaceæ** p. 23
 Woody plants **Urticaceæ**
314. Stamens as many as the corolla-lobes 315
 Stamens less than the number of corolla-lobes; corolla somewhat 2-lipped **Martyniaceæ** p. 27
315. Ovule solitary **Salvadoraceæ**
 Ovules many 316
316. Stamens opposite the corolla-lobes **Primulaceæ**
 Stamens alternating with the corolla-lobes 317
317. Shrubs, usually climbers; fruit a globose or pear-shaped berry **Apocynaceæ** p. 28
 Herbaceous plants; fruit a capsule **Gentianaceæ**

318. Ovule solitary in each ovary-chamber 319
 Ovules 2 or more in each ovary-chamber 334
319. Ovary 2-chambered 320
 Ovary 3-4- or more-chambered 330
320. Lateral sepals much enlarged, forming 2 coloured wings . . **Polygalaceæ**
 Lateral sepals not enlarged and forming wings 321
321. Stamens free from the corolla or adnate to the corolla at the base
 only 322
 Stamens inserted on the corolla-tube or in the corolla-throat . . . 324
322. Fruit fleshy **Ebenaceæ**
 Fruit a capsule 323
323. Stamens as many or twice as many as the corolla-lobes . . **Ericaceæ**
 Stamens less than the number of the corolla-lobes, if as many then
 the corolla-tube split down in front **Scrophulariaceæ**
324. Stamens 4 or 2 325
 Stamens 5 **Apocynaceæ**
325. Stamens as many or twice as many as the corolla-lobes 326
 Stamens less than the number of corolla-lobes 328
326. Anthers opening by apical pores **Ericaceæ**
 Anthers opening by slits 327
327. Calyx 4-5-lobed **Verbenaceæ**
 Calyx 3-lobed **Scrophulariaceæ**
328. Fruit with 4 longitudinal wings **Pedaliaceæ**
 Fruit not winged 329
329. Fruit a capsule **Acanthaceæ**
 Fruit a small drupe, or dividing into indehiscent nutlets, or fruit
 indehiscent **Verbenaceæ**
330. Stamens free from the corolla, or adnate to the corolla at the base
 only 331
 Stamens inserted on the corolla-tube or in the corolla-throat . . . 332
331. Leaves ericoid; fruit a capsule **Ericaceæ**
 Leaves not ericoid; fruit fleshy **Ebenaceæ**
332. Stamens 5 **Borraginaceæ**
 Stamens 2-4 333
333. Ovary distinctly 4-lobed **Labiataæ**
 Ovary indistinctly lobed, if distinctly lobed or carpels more or
 less free than fruit a drupe **Verbenaceæ**
334. Fruit of 2 or more follicles, more rarely 1 by abortion 335
 Fruit a capsule, berry, drupe, nut, or indehiscent 338
335. Ovary 2-chambered; filaments usually connate to form a staminal-
 column; pollen massed in pollinia **Asclepiadaceæ**
 Gynæcium of 2 or more free carpels; filaments not united to form
 a staminal-column; pollen not in pollinia 336
336. Corona present within the corolla **Asclepiadaceæ**
 Corona absent 337
337. Stamens inserted on the corolla-tube or in the corolla-throat; carpels 2
 **Apocynaceæ**
 Stamens usually free from the corolla, or adnate to the corolla at
 the base only; carpels more than 2 **Crassulaceæ**
338. Petals (staminodia?) many, shorter than the sepals **Aizoaceæ**
 Petals definite 339
339. Stamens less than the number of the corolla-lobes 340
 Stamens as many as or more than the number of the corolla-lobes . . 347
340. Stamens 2 341
 Stamens 4 343
341. Ovules usually 2 in each ovary-chamber, rarely 3 or 4 342
 Ovules numerous in each ovary-chamber **Scrophulariaceæ**
342. Corolla regular **Oleaceæ**
 Corolla 1- or 2-lipped **Acanthaceæ**
343. Fruit a drupe or berry 344
 Fruit a capsule or indehiscent, but not fleshy 345

344. Ovules 4-6 in each ovary-chamber; seed often solitary . . . **Myoporaceæ**
 Ovules numerous; seeds many . . . **Scrophulariaceæ**
345. Fruit usually furnished with horns, spines, or wings; plants with sticky glandular hairs . . . **Pedaliaceæ**
 Fruit usually without appendages; plants rarely with glandular hairs . . . 346
346. Ovules and seeds few, usually 2-4 . . . **Acanthaceæ**
 Ovules and seeds many . . . **Scrophulariaceæ**
347. Styles free; a small succulent plant with the flowers surrounded by a rosette of leaves . . . **Crassulaceæ**
 Style simple; flowers not surrounded by a rosette of leaves . . . 348
348. Posterior sepal large, petaloid, produced into a hollow spur or sac . . . **Balsaminaceæ**
 Posterior sepal not spurred nor saccate . . . 349
349. Leaves ericoid; anthers opening by terminal pores or slits and usually appendaged at the base . . . **Ericaceæ**
 Leaves not ericoid; anthers rarely appendaged at the base . . . 350
350. Leaves whorled . . . 351
 Leaves opposite . . . 352
351. Flowers in terminal thyrsoid panicles . . . **Loganiaceæ**
 Flowers more or less solitary and partly hidden by the leaves . . . **Solanaceæ**
352. Herbaceous plants . . . 353
 Woody plants . . . 354
353. Stamens inserted in the corolla-throat or in the upper part of the corolla-tube; corolla regular . . . **Gentianaceæ**
 Stamens inserted at the base of the corolla-tube, if on the upper part then the corolla irregular . . . **Scrophulariaceæ**
354. Ovules 2-4 in each ovary-chamber, rarely more, but if so then plants with bifid spines . . . **Apocynaceæ**
 Ovules many in each ovary-chamber . . . 355
355. Calyx 4-fid. very rarely 5-fid, but if so then large shrubs or trees . . . **Loganiaceæ**
 Calyx 5-fid; a glabrous epiphytic shrub . . . **Scrophulariaceæ**
356. Stamens indefinite . . . 357
 Stamens definite, 3-5 . . . 358
357. Trees or shrubs; petals 4-5 . . . **Myrtaceæ**
 Succulent herbs; petals numerous . . . **Aizoaceæ**
358. Flowers in heads surrounded by involueral-bracts . . . **Dipsaceæ**
 Flowers various, if in heads then not surrounded by a definite involuere . . . 359
359. Ovules many in each ovary-chamber . . . 360
 Ovule solitary in each ovary-chamber, or ovule and placenta not differentiated, but then stem parasites . . . 361
360. Ovary 3-5-chambered, rarely 2-chambered; leaves without stipules . . . **Campanulaceæ**
 Ovary 2-chambered; leaves with interpetiolar stipules . . . **Rubiaceæ**
361. Stamens 3 . . . **Valerianaceæ**
 Stamens 4-6 . . . 362
362. Ovary 1-chambered; stem parasites . . . **Loranthaceæ**
 Ovary 2-or more-chambered; non-parasitic plants . . . **Rubiaceæ**
363. Flowers with 1 perianth, or perianth absent . . . 364
 Flowers with a calyx and corolla . . . 369
364. Perianth-segments, when present, free . . . 365
 Perianth segments joined . . . 367
365. Ovary superior . . . 366
 Ovary inferior . . . **Halorrhagidaceæ**
366. Leaves opposite; gynæcium of several free carpels . . . **Ranunculaceæ**
 Leaves verticillate; ovary 1-chambered; aquatic herbs . . . **Ceratophyllaceæ**
367. Ovary superior . . . 368
 Ovary inferior . . . **Compositæ**

368. Aquatic plants; leaves whorled **Ceratophyllaceæ**
 Land plants; leaves opposite **Zygophyllaceæ**
369. Petals free 370
 Petals joined at least at the base 376
370. Ovary superior 371
 Ovary inferior **Halorrhagidaceæ**
371. Stamens 8, 10, or 15 (2-3 times as many as the petals), or numerous,
 occasionally filaments without anthers 372
 Stamens 4-6 (as many as or more than the number of petals but
 not twice as many) 375
372. Gynæcium of many free carpels **Ranunculaceæ**
 Gynæcium of fused carpels, if carpels 2 and easily separable then
 flowers in a long dense terminal cylindric raceme 373
373. Styles free **Cunoniaceæ**
 Style simple or styles joined to a central column, rarely style 0 374
374. Styles adhering to a central column from which they separate in
 the fruit **Geraniaceæ**
 Style simple, rarely absent **Zygophyllaceæ**
375. Stamens 4; ovary with a solitary ovule in each chamber . **Meliaceæ**
 Stamens 6; ovary with more than one ovule in each chamber
 **Cruciferae**
376. Ovary superior 377
 Ovary inferior 383
377. Gynæcium of free carpels; stamens 8 **Crassulaceæ**
 Gynæcium of fused carpels; stamens 2-5 378
378. Leaves digitately compound 379
 Leaves not digitately compound, rarely trifoliate, but if so then
 seeds winged 380
379. Calyx campanulate, usually enlarged in the fruit; ovule solitary
 in each ovary-chamber **Verbenaceæ**
 Calyx divided almost to the base; ovules many in each ovary-
 chamber **Pedaliaceæ**
380. Stamens 2; corolla regular **Oleaceæ**
 Stamens 4-5; corolla 2-lipped, sub-2-lipped, or oblique 381
381. Ovules 3 or more in each ovary-chamber 382
 Ovule solitary in each ovary-chamber **Labiatae**
382. Calyx 5-toothed or spathaceous; flowers rarely solitary . **Bignoniaceæ**
 Calyx lobed almost to the base; flowers solitary on long pedicels
 **Scrophulariaceæ**
383. Flowers solitary or fascicled, or inflorescence corymbose . **Valerianaceæ**
 Flowers in heads **Dipsacæ**
384. Leaves simple 385
 Leaves compound 684
385. Flowers with 1 perianth whorl, or perianth absent 386
 Flowers with a calyx and corolla 482
386. Perianth-segments, when present, free 387
 Perianth-segments joined 417
387. Ovary superior 388
 Ovary inferior 413
388. Apparent flower consisting of stamens (male flowers) and an ovary
 (female flower), the whole surrounded by an involucre; juice
 usually milky **Euphorbiaceæ**
 Flowers normal, with or without a perianth 389
389. Flowers naked, without a perianth, rarely subtended by 2 minute
 bracts; perianth sometimes absent only in the female flowers . 390
 Perianth present 395
390. Aquatic herbs **Podostemonaceæ**
 Herbs, sub-shrubs, or small trees 391
391. Flowers in heads joined together by glutinous hairs; heads surrounded
 by an involucre of bracts **Urticaceæ**
 Flowers not in heads surrounded by an involucre of bracts 392

392. Shrubs, with the leaves grey on both sides **Chenopodiaceæ** p. 217
 Small trees, shrubs, or herbs; leaves not grey, if whitish on the
 undersurface then seeds hairy 393
393. Ovules several; seed with a basal tuft of hairs **Salicaceæ**
 Ovule solitary; seed not with a basal tuft of hairs 394
394. Woody plants; fruits covered with wax **Myricaceæ**
 Herbs, if somewhat woody, then leaves large and palmately veined
Piperaceæ
395. Gynæcium of 2 or more free carpels, or carpels almost free 396
 Gynæcium of fused carpels; ovary 1- or more-chambered 398
396. Gynæcium of 2 carpels **Rosaceæ**
 Gynæcium of more than 2 carpels 397
397. Gynæcium globose, of 5-12 more or less distinct carpels arranged
 round a central axis **Phytolaccaceæ** p. 250
 Carpels free, spirally arranged **Ranunculaceæ**
398. Ovary 1-chambered, with a solitary ovule 399
 Ovary 2- or more-chambered, if 1-chambered then ovules 2 or more
 in each chamber 407
399. Leafless twining stem parasites without chlorophyll **Lauraceæ**
 Non-parasitic plants 400
400. Styles distinct or almost so 401
 Style simple 406
401. Annual herbs, rarely small ashy grey shrubs; ovule basal 402
 Trees or shrubs; ovule pendulous 405
402. Small ashy-grey shrubs; fruits fleshy **Chenopodiaceæ** p. 217
 Herbs; fruits dry 403
403. Petiole expanded at the base into a membranous sheath **Polygonaceæ**
 Petiole not sheathing at the base 404
404. Perianth glumaceous; fruit smooth **Amarantaceæ** p. 221
 Perianth herbaceous; fruit more or less warted or spiny
Phytolaccaceæ p. 259
405. Stamens many **Rosaceæ**
 Stamens 4-5 **Ulmaceæ**
406. Stamens adnate to the apex of the perianth-segments in spoon-
 like depressions **Proteaceæ**
 Stamens free from the perianth-segments **Moraceæ**
407. Ovary on an evident gynophore **Capparidaceæ**
 Ovary sessile 408
408. Valves of fruit separating from the base upwards, leaving a septum
 with the seeds attached **Cruciferaæ**
 Fruit a berry, valvular capsule, or fruit dividing into 1-seeded cocci 409
409. Ovules parietal; stigma broadly peltate **Flacourtiaceæ** p. 21
 Ovules pendulous, basal or axile; stigma not peltate; styles
 sometimes free 410
410. Ovules axile **Aizoaceæ** p. 230
 Ovules pendulous or basal 411
411. Ovules pendulous **Euphorbiaceæ**
 Ovules basal 412
412. Small undershrubs **Phytolaccaceæ** p. 250
 Trees or large shrubs **Sapindaceæ**
413. Ovary 1-chambered 414
 Ovary 2-5-chambered 415
414. Style simple; stamens 5 **Santalaceæ**
 Styles free; stamens 1-2 **Halorrhagidaceæ**
415. Styles free; ovule solitary in each ovary-chamber **Umbelliferaæ**
 Style simple; ovules 3 or more in each ovary-chamber 416
416. Stamens numerous **Begoniaceæ**
 Stamens 3-5 **Oenotheraceæ**
417. Ovary superior 418
 Ovary inferior 468

418. Apparent flower consisting of stamens (male flowers) and an ovary (female flower), the whole surrounded by an involucre; juice usually milky **Euphorbiaceæ**
- Flowers normal, with or without a perianth 419
419. Ovary 2-6-chambered 420
- Ovary 1-chambered, or gynæcium of free carpels 431
420. Aquatic herbs **Podostemonaceæ**
- Herbs or woody plants, not aquatic 421
421. Flowers unisexual 422
- Flowers bisexual 425
422. Fruits winged **Sapindaceæ**
- Fruits not winged 423
423. Ovules 2, axile, one above the other **Flacourtiaceæ** p. 412
- Ovules basal or pendulous 424
424. Ovules pendulous **Euphorbiaceæ**
- Ovules basal **Phytolaccaceæ**
425. Style simple 426
- Styles free or almost so 428
426. Ovules many in each ovary-chamber **Lythraceæ**
- Ovule solitary in each ovary-chamber 427
427. Perianth-tube cylindric; stamens in 2 rows, adnate to the perianth-tube **Thymelæaceæ**
- Perianth-tube not cylindric; stamens in 1 row, hypogynous **Rhamnaceæ**
428. Herbs or small undershrubs; fruit a capsule or dividing into two 1-seeded cocci 430
- Large shrubs or trees; fruit a large globose berry or drupe 429
429. Fruit a berry; ovules parietal **Flacourtiaceæ** p. 414
- Fruit a drupe; ovule solitary, basal **Rhamnaceæ**
430. Fruit a capsule **Aizoaceæ** p. 235
- Fruit dehiscing into two 1-seeded cocci **Phytolaccaceæ**
431. Flowers unisexual 432
- Flowers bisexual 451
432. Fruit a fig **Moraceæ** p. 1
- Fruit a capsule, or nut, or fleshy, or breaking up into separate carpels 433
433. Stamens in 2 or 4 whorls; the innermost whorl sometimes reduced to staminodes; anthers of outermost whorl opening by small lids **Lauraceæ** p. 101
- Stamens in 1 whorl, if in more than one whorl then stamens many 434
434. Female flowers arranged in cones; male flowers in globose or conical heads **Proteaceæ**
- Female flowers not arranged in cones 435
435. An aromatic shrub, with gland-dotted leaves **Rutaceæ**
- Herbs, shrubs, or trees, not aromatic; leaves not gland-dotted 436
436. Herbs or small undershrubs, if large shrubs then leaves grey 437
- Trees or shrubs, sometimes climbing shrubs 442
437. Gynæcium of free or almost free carpels **Phytolaccaceæ**
- Carpels not free, or ovary sometimes 1-chambered 438
438. Stamens inserted on the calyx-tube **Rosaceæ**
- Stamens inserted at the base of the perianth-segments 439
439. Fruit exserted from the perianth, or fruits surrounded by sticky hairs and enclosed in the involucre **Urticaceæ**
- Fruit enclosed in the perianth or enlarged bracteoles 440
440. Stipules small, scarious, entire or ciliate, or petiole dilated at the base into a membranous sheath 441
- Stipules 0; petiole not sheathed **Chenopodiaceæ** p. 217
441. Stipules present **Caryophyllaceæ**
- Petiole sheathed at the base **Polygonaceæ**
442. Carpels 2 or more, free or almost so 443
- Carpels not free; ovary sometimes 1-chambered 444

443. Ovule solitary in each carpel **Phytolaccaceæ**
 Ovules many in each carpel **Sterculiaceæ**
444. Ovules parietal **Flacourtiaceæ** p 216
 Ovules basal or apical 445
445. Stigma sessile, disc-like or hemispherical, wider than the top of
 the ovary 446
 Stigma not sessile and disc-like 447
446. Stamens 3-5 **Icacinaceæ**
 Stamens 10-15 **Monimiaceæ**
447. Ovule solitary 448
 Ovules two 450
448. Stamens as many as the perianth-lobes **Urticaceæ**
 Stamens more than the number of the perianth-lobes 449
449. Stamens 8, normally twice the number of the perianth-lobes
 **Nyctaginaceæ**
 **Monimiaceæ**
450. Stamens inserted in the calyx-throat **Rosaceæ**
 Stamens inserted at the base of the perianth **Euphorbiaceæ**
451. Stamens in 2-4 whorls; anthers of the outermost whorl opening
 by small lids **Lauraceæ** p 216
 Stamens in 1 whorl, if in more than 1 whorl then stamens many or
 anthers not opening by apical lids 452
452. Corona present **Passifloraceæ**
 Flowers without a corona 453
453. Ovary on a long cylindric gynophore which is longer or as long
 as the stamens **Capparidaceæ**
 Ovary sessile or shortly stalked 454
454. Ovules parietal **Flacourtiaceæ** p 217
 Ovules basal or apical 455
455. Ovules 2 or more 456
 Ovule solitary 458
456. Calyx deciduous leaving a narrow ring; stamens perigynous
 **Rosaceæ**
 Calyx not deciduous; stamens hypogynous 457
457. Stamens as many as the number of the perianth-segments
 **Amarantaceæ** p 217
 Stamens more than the number of the perianth-segments
 **Sterculiaceæ**
458. Styles free or almost so, or style absent and stigmas free 459
 Styles simple 463
459. Perianth-segments glumaceous **Amarantaceæ** p 217
 Perianth-segments herbaceous 460
460. Ovule on a long basal funicle **Caryophyllaceæ**
 Ovule sessile or almost so 461
461. Fruit more or less warted or spiny, or fruits fleshy and in a dense
 raceme **Phytolaccaceæ**
 Fruit smooth 462
462. Fruit an indehiscent 3-cornered or lenticular nut; petiole sheathed
 at the base **Polygonaceæ**
 Fruit usually an indehiscent utricle enclosed in and falling off with
 the perianth; petiole not sheathed at the base **Chenopodiaceæ** p 217
463. Stamens inserted in spoon-like depressions at the apex of the
 perianth-segments **Proteaceæ**
 Stamens not inserted in spoon-like depressions at the apex of the
 perianth-segments 464
464. Stipules adnate to the petiole **Rosaceæ**
 Stipules absent 465
465. Filaments connate at the base 466
 Filaments free 467
466. Perianth glumaceous **Amarantaceæ** p 217
 Perianth herbaceous **Nyctaginaceæ**

467. Woody plants with tough bark; stigma simple . . . **Thymelæaceæ**
 Sub-woody plants; bark not tough; stigmas 2-3 . . . **Chenopodiaceæ** *p. 27*
468. Root parasites, usually with scale-like leaves . . . 469
 Non-parasitic plants; leaves normal, very rarely stem-parasites with
 yellow twining stems and reduced leaves . . . 472
469. Anthers connate into a flexuose ring or in an exerted head . . 470
 Anthers free . . . 471
470. Flowers bisexual . . . **Hydnoraceæ**
 Flowers unisexual . . . **Rafflesiaceæ**
471. Stamens 2-3 . . . **Balanophoraceæ**
 Stamens 4-5 . . . **Santalaceæ**
472. Flowers unisexual . . . 473
 Flowers bisexual, if unisexual with occasional bisexual flowers then
 stamens twice as many as the number of the perianth-lobes
 or stamens many . . . 476
473. Stemless herbs, growing in water or wet places . . **Halorrhagidaceæ**
 Trees or shrubs, rarely undershrubs or half herbaceous . . 474
474. Undersurface of leaves and young twigs covered with stellate hairs
Hamamelidaceæ
 Stellate hairs absent . . . 475
475. Fruit winged; anthers not joined to the perianth-segments by
 a bundle of hairs . . . **Hernandiaceæ**
 Fruit not winged; anthers joined to the perianth-segments by
 a bundle of hairs . . . **Santalaceæ**
476. Perianth 2-lipped . . . **Aristolochiaceæ**
 Perianth equal or sub-equal . . . 477
477. Ovule solitary in each ovary-chamber . . . 479
 Ovules 2 or more in each ovary-chamber . . . 478
478. Fruit dry or fleshy, crowned with the persistent perianth, or anthers
 attached to the perianth-segments by a tuft of hairs
Santalaceæ
 Fruit winged; anthers not attached to the perianth-segments by
 a tuft of hairs . . . **Combretaceæ**
479. Flowers in heads surrounded by a common involuere; anthers
 joined . . . **Compositæ**
 Flowers not in heads, if flowers massed then anthers not joined . . 480
480. Perianth 6-8-lobed or -partite; stamens in 3-4 whorls . . **Lauraceæ** *p. 28*
 Perianth 3-5-lobed; stamens in one whorl . . . 481
481. Perianth-lobes woolly or bearded . . . **Rhamnaceæ**
 Perianth-lobes not woolly or bearded . . . **Aizoaceæ** *p. 29*
482. Petals free . . . 483
 Petals joined . . . 610
483. Ovary superior . . . 484
 Ovary inferior . . . 591
484. Plants furnished with tendrils . . . 485
 Plants without tendrils . . . 486
485. Ovary 2-4-chambered, with 2 ovules in each chamber . . . **Vitaceæ**
 Ovary 1-chambered, with numerous ovules . . . **Passifloraceæ**
486. Gynæcium of 2 or more free carpels; more rarely styles connate
 and ovaries free . . . 487
 Gynæcium of fused carpels; ovary sometimes 1-chambered . . 496
487. Floating aquatic plants, with many petals and peltate leaves
Nymphæaceæ
 Terrestrial plants; petals definite; leaves not peltate . . 488
488. Filaments connate into a staminal-column . . . 489
 Filaments free . . . 490
489. Corolla with a corona . . . **Asclepiadaceæ**
 Corolla without a corona . . . **Malvaceæ**
490. Herbaceous plants with radical leaves, or sub-decumbent semi-
 herbaceous plants . . . 491
 Trees or shrubs . . . 492

491. Carpels many, on an enlarged torus **Ranunculaceæ**
 Carpels 2, at the bottom of the calyx-tube **Rosaceæ**
492. Flowers unisexual 493
 Flowers bisexual 494
493. Stamens 6 **Menispermaceæ**
 Stamens usually indefinite **Anonaceæ**
494. Aromatic shrubs with gland-dotted leaves **Rutaceæ**
 Trees or shrubs, not aromatic ; leaves not gland-dotted 495
495. Sepals 3 ; styles distinct **Anonaceæ**
 Sepals 5 ; style simple **Ochnaceæ**
496. Ovary open at the top ; petals 2 **Resedaceæ**
 Ovary completely closed ; petals rarely 2 497
497. Posterior sepal produced into a long spur **Balsaminaceæ**
 Posterior sepal not produced into a long spur, very rarely somewhat
 saccate 498
498. Ovary 1-chambered 499
 Ovary 2- or more- chambered 538
499. Leaves covered with stalked viscid glands **Droseraceæ**
 Leaves not covered with stalked viscid glands 500
500. Flowers with a corona within the corolla **Passifloraceæ**
 Flowers without a corona 501
501. Ovule solitary 502
 Ovules 2 or more 515
502. Filaments connate ; corolla not regular 503
 Filaments free, if connate then the corolla regular or the staminal-
 column discoid at the apex and the anthers in a marginal ring 504
503. Stamens 8 ; two sepals large, coloured and wing-like **Polygalaceæ**
 Stamens usually 10 ; sepals not enlarged and wing-like **Leguminosæ**
504. Twining herbs ; sepals 2 **Basellaceæ**
 Herbs or shrubs, rarely twiners, but if so then sepals not 2 505
505. Sepals 4 ; petals 4 ; stamens usually 6 ; plants usually herbaceous
 Cruciferae
 Sepals and petals 5 or more, rarely only 4, or petals rarely 3, if petals
 4 then trees or shrubs 506
506. Styles free or almost so 507
 Style simple or cleft 509
507. Sepals 5, or calyx 5-toothed 508
 Sepals 6 **Menispermaceæ**
508. Calyx scarious, tubular, 5-toothed **Plumbaginaceæ**
 Sepals herbaceous, almost free **Anacardiaceæ**
509. Stamens epigynous **Rosaceæ**
 Stamens hypogynous or inserted on the calyx-tube 510
510. Stamens many **Ochnaceæ**
 Stamens 4-10 511
511. Flowers in terminal panicles **Anacardiaceæ**
 Flowers not in terminal panicles 512
512. Ovules suspended from a long basal funicle **Plumbaginaceæ**
 Ovule basal, or apical, or on a free-central placenta 513
513. Calyx-tube long, cylindric **Thymelæaceæ**
 Calyx-tube lobed or divided almost to the base 514
514. Sepals 4 or 5 ; ovules basal or on a free-central placenta **Myrsinaceæ**
 Sepals 6 ; ovules apical **Menispermaceæ**
515. Shrubs or small trees, with much reduced scale-like leaves
 Tamaricaceæ
 Leaves not much reduced and scale-like 516
516. Sepals 4, or calyx 4-lobed 517
 Sepals 5 or more, rarely sepals sometimes 2 or 3 520
517. Ovules on long funicles ; leaves heath-like **Frankeniaceæ**
 Ovules sessile or shortly stalked ; leaves not heath-like 518
518. Filaments unequal ; stamens definite **Cruciferae**
 Filaments equal ; stamens sometimes numerous 519

519. Ovary sessile or on a convex torus **Flacourtiaceæ** p 41
 Ovary on a long stalk **Capparidaceæ**
520. Filaments all connate, not connate into 3 or 4 bundles 521
 Filaments free, if somewhat connate or connate into bundles then
 ovules on 3 parietal placentas 524
521. Sepals 3 **Canellaceæ**
 Sepals 5 522
522. Ovary inserted on one side of the calyx-mouth **Rosaceæ** f 32
 Ovary at base of the calyx 523
523. Flowers distinctly zygomorphic **Leguminosæ**
 Flowers regular or almost so **Sterculiaceæ** p 43
524. Calyx-segments 2-3 525
 Calyx-segments 5 or more, rarely 3, but if so then woody plants 526
525. Ovules basal or on a free-central placenta **Portulacaceæ**
 Ovules parietal **Papaveraceæ**
526. Flowers unisexual **Flacourtiaceæ** p 41
 Flowers bisexual 527
527. Ovules from the apex of a long basal funicle **Frankeniaceæ**
 Ovules not suspended from a long basal funicle 528
528. Ovules on a free-central placenta 529
 Ovules basal, apical, or parietal 530
529. Stamens 5 **Myrsinaceæ**
 Stamens usually 3, usually with 2-fid or 2-partite staminodes **Olacaceæ**
530. Stamens perigynous 531
 Stamens hypogynous 532
531. Petals equal **Rosaceæ**
 Petals unequal **Leguminosæ**
532. Style simple 533
 Styles free 537
533. Ovary on a long stalk; stamens numerous **Capparidaceæ**
 Ovary sessile or on a convex torus, if shortly stalked then stamens
 10 or some reduced to staminodes 534
534. Stamens 3-10 535
 Stamens numerous **Flacourtiaceæ** p 41
535. Petals unequal; stamens 10 **Leguminosæ**
 Petals equal or sub-equal, if unequal with the lowest petal largest
 then stamens 5 536
536. Fruit a capsule; ovules parietal **Violaceæ**
 Fruit a drupe; ovules pendulous **Icacinaeæ**
537. Herbs or small undershrubs; stamens alternating with the petals
 **Turneraceæ**
 Trees or large shrubs; stamens opposite the petals **Flacourtiaceæ** p 41
538. Leaves covered with stalked viscid glands **Droseraceæ**
 Leaves not covered with stalked viscid glands 539
539. Ovary 5-chambered, rarely 3-chambered, but then stamens united
 to form a staminal-column 5-toothed at the apex and the leaves
 stellately hairy 540
 Ovary 2-4- (rarely 10-20-) chambered 553
540. Ovules 3 or more in each ovary-chamber 541
 Ovules 1-2 in each ovary-chamber 547
541. Stamens 8 **Melanthaceæ**
 Stamens as many to 4 times as many as the petals, or indefinite 542
542. Filaments united, or petals spirally twisted in aestivation 543
 Filaments free, not flattened nor cruciform 544
543. Stamens connate at the base, or petals spirally twisted in aestivation
 **Sterculiaceæ**
 Stamens connate into a staminal-column **Malvaceæ**
544. Stamens inserted on the calyx-tube **Lythraceæ**
 Stamens hypogynous, free from the calyx-tube 545
545. Stamens as many as the petals **Pittosporaceæ**
 Stamens twice as many as the petals, or more 546

546. Stamens twice as many as the petals **Melanthaceæ**
 Stamens numerous **Tiliaceæ**
547. Filaments connate 548
 Filaments free, if connate at the base then styles separating at maturity from a central axis 550
548. Filaments connate into a long cylindric tube 10-toothed at the summit, if connate into a short tube only then stamens 8 . . . **Meliaceæ**
 Filaments connate at the base only; stamens 5 or 10-20 . . . 549
549. Stamens 5 **Linaceæ**
 Stamens 10-20 **Sterculiaceæ**
550. Ovules 2 in each ovary-chamber 551
 Ovules solitary in each ovary-chamber **Zygophyllaceæ**
551. Large trees or small aromatic shrubs; leaves pellucid-dotted . **Rutaceæ**
 Herbs or shrubs, if aromatic then leaves not pellucid-dotted . . 552
552. Fruit dividing at maturity into distinct carpels which separate from a cylindric axis; carpels not prickly **Geraniaceæ**
 Fruit a prickly capsule **Tiliaceæ**
553. Fertile stamens as many as the petals, if apparently less owing to the staminodes resembling the petals then aromatic shrubs with gland-dotted leaves 554
 Fertile stamens more or less than the number of the petals . . 571
554. Flowers unisexual 555
 Flowers bisexual 559
555. Ovule solitary in each ovary-chamber 556
 Ovules 2 in each ovary-chamber 558
556. Filaments usually connate, if free then fruit a 3-valved capsule and petals not much larger than the sepals . . . **Euphorbiaceæ**
 Filaments free 557
557. Stamens opposite the petals **Rhamnaceæ** p 214
 Stamens alternating with the petals **Hamamelidaceæ**
558. Styles free or almost so **Euphorbiaceæ**
 Style simple **Vitaceæ** f 214
559. Ovule solitary in each ovary-chamber 560
 Ovules 2 or more in each ovary-chamber 562
560. Ovule pendulous 561
 Ovule basal, erect **Rhamnaceæ** p 214
561. Small shrubs, with usually ericoid leaves; venation not distinct
 Bruniaceæ
 Trees or shrubs; leaves broad, distinctly pinnately veined
 Anacardiaceæ 1 80
562. Ovules many in each ovary-chamber, more rarely ovules few . . 563
 Ovules 2 in each ovary-chamber 567
563. Corona present inside the petals **Asclepiadaceæ**
 Corona absent 564
564. Shrubs, armed with strong spines **Celastraceæ**
 Small herbs, shrubs, or trees, not spiny 565
565. Herbs or small undershrubs **Lythraceæ**
 Trees or large shrubs 566
566. Calyx cup-shaped, toothed; stamens opposite the petals
 Heteropyxidaceæ
 Sepals almost free; stamens alternating with the petals . **Pittosporaceæ**
567. Disc absent **Bruniaceæ**
 Disc conspicuous, either entire or of 5 free glands 568
568. Small aromatic shrubs; leaves gland-dotted **Rutaceæ**
 Trees or shrubs, sometimes climbing, not aromatic; leaves not gland-dotted 569
569. Climbing plants, furnished with tendrils **Vitaceæ** p 214
 Plants without tendrils 570
570. Acaulescent plants, with deep underground stems . . **Dichapetalaceæ**
 Trees, sometimes small shrubs, but always with evident stems
 Celastraceæ

571. Fertile stamens less than the number of the petals 572
 Fertile stamens more than the number of the petals 575
572. Stamens inserted on the calyx-tube **Lythraceæ**
 Stamens free from the calyx 573
573. Stamens 3; staminodes often 6 and 2-fid or 2-partite **Oleaceæ**
 Stamens 2-4, sometimes 2-3 filaments without anthers but then
 flowers with a conspicuous disc; staminodes absent 57
574. Disc conspicuous; ovary 3-chambered; ovules 2-6 in each ovary-
 chamber **Hippocrateaceæ**
 Disc 0; ovary 2-chambered; ovules numerous in each ovary-
 chamber **Scrophulariaceæ** p 55
575. Sepals 4; petals 4; stamens 6 **Cruciferae**
 Sepals and petals rarely 4, but if so then stamens not 6 576
576. Aromatic shrubs; leaves with immersed pellucid glands, usually
 ericoid **Rutaceæ**
 Non-aromatic plants; leaves rarely gland-dotted, but if so then
 stamens inserted on the calyx-tube 577
577. Ovary winged **Malpighiaceæ**
 Ovary not winged 578
578. Filaments united, at least at the base 579
 Filaments free 584
579. Ovary adnate to one side of the throat of the receptacle **Rosaceæ**
 Ovary at the base of the calyx 580
580. Flowers unisexual **Euphorbiaceæ**
 Flowers bisexual 581
581. Stamens twice as many as the petals 582
 Stamens 3-4 times as many as the petals **Sterculiaceæ**
582. Filaments connate into a long cylindric tube 10-toothed above **Meliaceæ**
 Filaments connate at the base 583
583. Fruit an inflated membranous capsule **Meliaceæ**
 Fruit not a membranous capsule **Erythroxylaceæ**
584. Stamens inserted on the calyx-tube, or perigynous 585
 Stamens free from the calyx 587
585. Leaves with immersed pellucid glands **Heteropyxidaceæ**
 Leaves without pellucid glands 586
586. Ovule solitary **Rosaceæ**
 Ovules many **Lythraceæ**
587. Stamens numerous, if only 5 then fruits echinate or setose 588
 Stamens definite 589
588. Flowers bisexual **Tiliaceæ**
 Flowers unisexual **Euphorbiaceæ**
589. Shrubs, with abortive spinescent branches **Oleaceæ**
 Trees or shrubs without abortive spinescent branches 590
590. Calyx urceolate or tubular, 4-toothed, persistent **Burseraceæ**
 Sepals free, or calyx small, cupular and 5-lobed **Sapindaceæ**
591. Stem parasites **Loranthaceæ**
 Non-parasitic plants 592
592. Ovary 1-chambered 593
 Ovary 2- or more-chambered 596
593. Stamens numerous **Cactaceæ**
 Stamens 1-10 594
594. Creeping herbs, or aquatic or marsh plants **Halorrhagidaceæ**
 Woody plants 595
595. Stamens as many as the petals **Bruniaceæ**
 Stamens twice as many as the petals **Combretaceæ**
596. Ovule solitary in each ovary-chamber 597
 Ovules 2 or more in each ovary-chamber 605
597. Stamens numerous **Loasaceæ**
 Stamens as many as or twice as many as the petals 598
598. Stamens twice as many as the petals **Rosaceæ**
 Stamens as many as the petals 599

599. Ovary 2-chambered 600
 Ovary 1- or 3-6-chambered 604
600. Flowers unisexual, if apparently bisexual then the under-surface
 of the leaves with stellate hairs **Hamamelidaceæ**
 Flowers bisexual; stellate hairs absent 601
601. Flowers solitary or 3-nate **Rhamnaceæ**
 Flowers in small heads, umbels, spikes, or racemes, with the spikes
 or racemes often paniced 602
602. Flowers in small heads; shrubs with the branches densely covered
 with small appressed leaves **Bruniaceæ**
 Flowers in spikes, racemes, or umbels; leaves not small and closely
 packed on the branches 603
603. Fruit fleshy **Araliaceæ**
 Fruit splitting into 2 mericarps **Umbelliferae**
604. Ovules erect, basal **Rhamnaceæ**
 Ovules pendulous **Bruniaceæ**
605. Stamens 20-30, or numerous 606
 Stamens 3-12 607
606. Ovules 2-6 in each ovary-chamber **Lecythidaceæ**
 Ovules many in each ovary-chamber **Myrtaceæ**
607. Flowers unisexual, if occasional bisexual flowers present then styles
 2 and free 608
 Flowers bisexual; style simple, rarely free, but if so then flowers
 crowded in the axils of the upper leaves 609
608. Stamens as many as the petals **Saxifragaceæ**
 Stamens not as many as the petals, if as many then 1 or more, or
 the stamens rudimentary and plants furnished with tendrils
 **Cucurbitaceæ**
609. Ovary 4-6-chambered; ovules numerous in each ovary-chamber
 **Enothraceæ**
 Ovary 2-3-chambered; ovules few in each ovary-chamber . **Bruniaceæ**
610. Ovary superior 611
 Ovary inferior 674
611. Posterior sepal petaloid and produced into a very long spur
 **Balsaminaceæ**
 Corolla sometimes spurred or saccate, but posterior sepal never
 produced into a long spur 612
612. Ovary 1-chambered 613
 Ovary 2 or more-chambered, or carpels free or deeply cleft or 633
613. Ovary open at the top; petals 2 **Resedaceæ**
 Ovary completely closed; petals very rarely 2 614
614. Flowers unisexual 615
 Flowers bisexual 617
615. Ovule solitary **Menispermaceæ**
 Ovules 3 or more 616
616. Ovules parietal; stamens alternating with the corolla-lobes
 **Achariaceæ**
 Ovules on a free-central placenta; stamens opposite the corolla-lobes
 **Myrsinaceæ**
617. Shrubs or small trees; leaves minute and scale-like . . . **Tamaricaceæ**
 Leaves not minute and scale-like, if much reduced then flowers
 zygomorphic or 2 of the sepals much enlarged and coloured . 618
618. Stamens 10 **Leguminosæ**
 Stamens less than 10 619
619. Root parasites; fleshy plants with reduced leaves . . . **Orobanchaceæ**
 Non-parasitic plants 620
620. Stamens more than the number of the petals **Polygalaceæ**
 Stamens as many as or less than the number of the corolla-lobes . 621
621. Stamens less than the number of the corolla-lobes 622
 Stamens as many as the corolla-lobes 624

622. Corolla 2-lipped, spurred or saccate **Lentibulariaceæ**
 Corolla 2-lipped or sub-equal, if 2-lipped then not spurred nor saccate 623
623. Valves of fruit spirally twisted when mature **Gesneraceæ** *P 20*
 Fruit furnished with two long recurved horns **Martyniaceæ**
624. Stamens free from the corolla, or adnate to the corolla-tube at the base only 625
 Stamens inserted on the corolla-tube or in the corolla-throat 629
625. Stamens alternating with the corolla-lobes **Sciacinaceæ** *P 38*
 Stamens opposite the corolla-lobes 626
626. A twining herb **Basellaceæ**
 Herbs, shrubs, or small trees, never twining 627
627. Styles free or divided into 5 stigmas **Plumbaginaceæ** *P 40*
 Styles simple; stigma sometimes capitate 628
628. Woody plants **Myrsinaceæ**
 Herbs **Primulaceæ** *P 42*
629. Stamens opposite the corolla-lobes 630
 Stamens alternating with the corolla-lobes 631
630. Twining herbs; sepals 2 **Basellaceæ**
 Erect herbs, rarely somewhat shrubby; sepals more than 2 **Primulaceæ** *P 44*
631. Inflorescence a spike or head of inconspicuous flowers **Plantaginaceæ**
 Inflorescence various, not a spike or head; flowers not inconspicuous 632
632. Aquatic or marsh plants **Gentianaceæ**
 Terrestrial plants **Convolvulaceæ**
633. Corona present within the corolla **Asclepiadaceæ**
 Corona absent 634
634. Carpels free *2-lobed, 2-lobed, 2-lobed* 635
 Carpels joined to form a 2- or more-chambered ovary *2-lobed* 637
635. Stamens numerous **Anonaceæ**
 Stamens 5 or 10 636
636. Style simple **Apocynaceæ**
 Styles free **Crassulaceæ**
637. Flowers unisexual 638
 Flowers bisexual 640
638. Plants furnished with tendrils **Vitaceæ**
 Plants without tendrils 639
639. Filaments connate below; fruit a capsule **Euphorbiaceæ**
 Filaments free; fruit a dry or fleshy berry **Ebenaceæ**
640. A herbaceous plant with much the general appearance of a liverwort; flowers sessile on a flat disc, surrounded by a rosette of leaves **Crassulaceæ**
 Herbs or shrubs; flowers not on a flat disc and surrounded by a rosette of leaves 641
641. Corolla-segments 3, if 5 then the 2 lateral sepals large and winglike; filaments joined at the base **Polygalaceæ**
 Corolla-lobes or -segments usually 4 or 5, very rarely more, if only 3 then the calyx forming a cup at the base of the fruit 642
642. Corolla more than 5-parted, usually 10-24-parted 643
 Corolla 4-6-parted, rarely 3-parted, sometimes 1-2-lipped 646
643. Herbs, covered with straight white spines **Hydrophyllaceæ**
 Woody plants, often climbers, not spiny 644
644. Stamens 2 **Oleaceæ**
 Stamens more than 2 645
645. Calyx 6-8-partite **Sapotaceæ**
 Calyx 3-5-toothed or -partite **Borraginaceæ**
646. Stamens more than the corolla-lobes 647
 Stamens as many as or less than the number of the corolla-lobes 649
647. Herbs **Oxalidaceæ**
 Woody plants 648

648. Ovule solitary in each ovary-chamber; leaves not ericoid, if ovules
2 then calyx forming a cup at the base of the fruit . . . **Ebenaceæ**
Ovules 2 or more in each ovary-chamber; leaves ericoid . . . **Ericaceæ**
649. Ovary 5-9-chambered, rarely 4-chambered, but then plants with
milky juice . . . 650
Ovary 2-4-chambered; juice not milky . . . 652
650. Stamens opposite the corolla-lobes . . . **Sapotaceæ**
Stamens alternating with the corolla-lobes . . . 651
651. Stigmas 4-6, persistent in fruit . . . **Aquifoliaceæ**
Style simple . . . **Pittosporaceæ**
652. Stamens free from the corolla . . . 653
Stamens inserted on the corolla-tube or in the corolla-throat . . . 654
653. Ovule solitary in each ovary-chamber, rarely ovules 2, but then calyx
forming a cup at the base of the fruit . . . **Ebenaceæ**
Ovules many in each ovary-chamber . . . **Pittosporaceæ**
654. Stamens less than the number of the corolla-lobes . . . 655
Stamens as many as the corolla-lobes . . . 663
655. Stamens 2; corolla regular . . . **Oleaceæ**
Stamens 4 or 5, if 2 then corolla 1- or 2-lipped . . . 656
656. Fruit fleshy . . . **Myoporaceæ**
Fruit a capsule, indehiscent, or splitting into indehiscent nutlets 657
Fruit a capsule . . . 658
Fruit indehiscent or splitting into indehiscent nutlets . . . 662
658. Ovules 2-10 in each ovary-chamber . . . 660
Ovule solitary or ovules numerous in each ovary-chamber . . . 659
659. Ovary-chambers divided by a spurious septum almost to the apex
thus appearing 4-chambered; capsule oblong, usually beaked
Pedaliaceæ
Ovary-chambers not divided by a spurious septum (2-chambered);
capsule various, rarely beaked . . . **Scrophulariaceæ**
660. Flowers zygomorphic . . . 661
Flowers regular . . . **Bruniaceæ**
661. Stamens as many as the corolla-lobes; seeds winged . . . **Bignoniaceæ**
Stamens less than the number of the corolla-lobes; seeds not winged
Acanthaceæ
662. Fruit indehiscent or tardily dehiscent, usually armed or winged
Pedaliaceæ
Fruit splitting into indehiscent nutlets . . . **Verbenaceæ**
663. Ovules numerous in each ovary-chamber . . . 664
Ovule solitary or ovules few in each ovary-chamber . . . 667
664. Herbs with a basal rosette of leaves . . . **Gentianaceæ**
Herbs or shrubs; leaves not in a basal rosette . . . 665
665. Spiny shrubs, with winged seeds . . . **Bignoniaceæ**
Herbs or shrubs, if spiny then fruit fleshy and seeds not winged . . . 666
666. Fruit fleshy, if a capsule then calyx with a distinct tube . . . **Solanaceæ**
Fruit a capsule; calyx divided almost to the base . . . **Scrophulariaceæ**
667. Corolla irregular; ovary 2-chambered . . . 668
Corolla regular, if sub-regular then ovary 4-chambered . . . 669
668. Ovule pendulous . . . **Scrophulariaceæ**
Ovule basal . . . **Verbenaceæ**
669. Fruit breaking up into indehiscent nutlets . . . **Borraginaceæ**
Fruit a drupe, indehiscent, or a capsule . . . 670
670. Trees or large shrubs . . . 671
Herbs, if small shrubs then leaves small or ericoid; more rarely
prostrate plants with non-ericoid leaves . . . 672
671. Corolla with a distinct tube; style evident, 2-cleft above
Borraginaceæ
Petals joined at the base only; style none; stigmas 4-6, persistent
in fruit . . . **Aquifoliaceæ**
672. Stamens 4; inflorescence a spike of inconspicuous flowers **Plantaginaceæ**
Stamens 5, if 4 then a parasite with a twining yellow stem . . . 673

673. Flowers small, in terminal leafy heads **Bruniaceæ**
 Flowers usually large, solitary or in axillary cymes **Convolvulaceæ**
674. Plants furnished with tendrils **Cucurbitaceæ**
 Plants without tendrils 675
675. Stamens 2 **Oleaceæ**
 Stamens 3-5, rarely 8-10, more rarely numerous 676
676. Stamens numerous **Myrtaceæ**
 Stamens 3-5, rarely 8-10 677
677. Stem parasites **Loranthaceæ**
 Non-parasitic plants 678
678. Stamens 8-10; anthers produced into 2 long tubes which open
 by an apical pore or slit **Ericaceæ**
 Stamens 3-5 679
679. Stamens as many as the petals 680
 Stamens (3) less than the number of petals **Valerianaceæ**
680. Plants with fleshy leaves and a fringed cup surrounding the stigma
Goodeniaceæ
 Leaves not fleshy; stigma without a fringed cup 681
681. Flowers in heads surrounded by a definite involucre of imbricating
 bracts; leaves usually radical **Dipsaceæ**
 Flowers rarely in heads, but if so then leaves ericoid and a definite
 involucre absent 682
682. Ovules on a free-central basal placenta; fruit a berry **Myrsinaceæ**
 Ovules pendulous or axile; fruit a capsule or breaking up into
 indehiscent cocci 683
683. Ovules pendulous **Bruniaceæ**
 Ovules axile **Campanulaceæ**
684. Perianth in one whorl, or perianth absent 685
 Calyx and corolla present 696
685. Perianth, when present, of free segments 686
 Perianth, when present, of joined segments 692
686. Ovary superior 687
 Ovary inferior **Umbelliferæ**
687. Aquatic herbs, with unisexual flowers **Hydrostachyaceæ**
 Herbs or woody plants, sometimes found in wet places; flowers
 bisexual 688
688. Ovary 1-chambered; ovules 1-2 689
 Ovary 2-chambered, or gynæcium of free carpels; ovule solitary in
 each ovary-chamber 690
689. Stamens sessile on the perianth-segments **Proteaceæ**
 Stamens free from the calyx and corolla **Leguminosæ**
690. Ovary 2-chambered **Sapindaceæ**
 Gynæcium of free carpels 691
691. Carpels 2 **Rosaceæ**
 Carpels many **Ranunculaceæ**
692. Ovary superior 693
 Ovary inferior 695
693. Leaves digitately compound **Sterculiaceæ**
 Leaves pinnately compound or 2-foliolate 694
694. Ovule solitary **Rosaceæ**
 Ovules 2 or more **Leguminosæ**
695. Anthers connate round the style **Compositæ**
 Anthers free **Hernandiaceæ**
696. Petals free 697
 Petals joined 739
697. Ovary superior 707
 Ovary inferior 737
698. Ovary 1-chambered, or gynæcium of free carpels 699
 Ovary 2-10-chambered 713
699. Ovary 1-chambered 700
 Gynæcium of 2 or more free carpels 709

700. Ovule solitary 701
 Ovules 2 or more 702
701. Disc fleshy, annular, or crenate, or of 5 scales, if inconspicuous then
 ovule suspended from a basal funicle **Anacardiaceæ**
 Disc inconspicuous; ovules parietal **Leguminosæ**
702. Corolla irregular or zygomorphic 703
 Corolla more or less regular 704
703. Sepals 2; stamens 6 in 2 bundles; herbs **Papaveraceæ**
 Sepals 5, often variously connate; stamens usually 10 or many,
 if fewer than 10 then woody plants **Leguminosæ**
704. Plants with tendrils **Passifloraceæ**
 Plants without tendrils 705
705. Sepals 3 or 4; petals usually 4 706
 Sepals 5, often variously connate; petals 5 707
706. Small trees with spiny branches; stamens 4 **Rutaceæ**
 Herbs, rarely undershrubs or small trees but if so then stamens
 10 to indefinite **Capparidaceæ**
707. Fruit a fleshy drupe **Rutaceæ**
 Fruit a pod or capsule 708
708. Stamens 5, alternating with 5 staminodes; fruit a siliqua-like
 capsule **Moringaceæ**
 Stamens 10 or numerous, if less than 10 then fruit a pod **Leguminosæ**
709. Herbs 710
 Woody plants 712
710. Scented plants with gland-dotted leaves **Rutaceæ**
 Plants not scented; leaves not gland-dotted 711
711. Carpels 2, if many then flowers perigynous and with 5 bracts adnate
 to the calyx and alternating with the lobes **Rosaceæ**
 Carpels many; flowers hypogynous **Ranunculaceæ**
712. Fruit a capsule, velvety **Connaraceæ**
 Fruit succulent or of 1-seeded achenes **Rosaceæ**
713. Stamens as many as the petals 714
 Stamens more or less than the number of petals 720
714. Fruit breaking up into 1-seeded cocci **Simarubaceæ**
 Fruit a capsule, drupe or berry 715
715. Branches armed with recurved prickles; leaves pellucid-dotted
 **Rutaceæ**
 Unarmed plants; leaves not pellucid-dotted 716
716. Climbing plants with tendrils **Vitaceæ**
 Plants without tendrils 717
717. Herbs **Cruciferae**
 Woody plants 718
718. Flowers solitary or 2-nate on long peduncles **Sterculiaceæ**
 Flowers not solitary nor 2-nate 719
719. Erect trees or shrubs **Meliaceæ**
 Climbing shrubs **Vitaceæ**
720. Stamens less than the number of the petals, if petals 4 and stamens
 6 then herbs usually found in water 721
 Stamens more than the number of the petals 722
721. Disc unilateral or semi-annular; fruit a woody or papery capsule;
 seeds not winged **Melanthaceæ**
 Disc 4-6-lobed; fruit a membranous capsule, leaving the dissepiments
 attached to the persistent axis **Meliaceæ**
722. Ovary 5-10-chambered 723
 Ovary 2-4-chambered 730
723. Flowers unisexual **Zygophyllaceæ**
 Flowers bisexual 724
724. Ovules 8 or more in each ovary-chamber, if only 2 then filaments
 connate into a long cylindric staminal-column 725
 Ovules 2 or 1 in each ovary-chamber; filaments sometimes connate
 at the base but not forming a cylindric staminal-column 727

725. Flowers solitary 726
 Flowers paniced **Meliaceæ**
726. Epicalyx of 5-20 segments; fruit a capsule **Malvaceæ**
 Epicalyx absent; fruit large, oblong, woody, indehiscent, filled
 with pulp **Bombacaceæ**
727. Herbaceous plants, rarely woody at the base **Geraniaceæ**
 Trees or woody shrubs 728
728. Leaflets with immersed glands especially on the margins **Rutaceæ**
 Leaflets without immersed glands 729
729. Leaves 2-foliolate **Zygophyllaceæ**
 Leaves pinnate **Meliaceæ**
730. Herbs, not climbers **Crucifereæ**
 Woody plants, if sub-herbaceous then climbers with a bladdery
 capsule 731
731. Filaments connate; fruit never a bladdery capsule **Meliaceæ**
 Filaments free, if connate at the base then fruit a bladdery capsule 732
732. Ovule solitary in each ovary-chamber 733
 Ovules 2 in each ovary-chamber 734
733. Stamens 4 **Meliaceæ**
 Stamens more than 4 735
734. Leaflets with immersed glands, especially on the margins **Rutaceæ**
 Leaflets without immersed glands 736
735. Stamens up to twice as many as the petals **Sapindaceæ**
 Stamens more than twice as many as the petals **Anacardiaceæ**
736. Calyx urceolate or tubular, 4-toothed **Burseraceæ**
 Calyx deeply divided or almost free, if campanulate then 5-lobed
 **Sapindaceæ**
737. Flowers solitary; ovary 5-10-chambered **Rosaceæ**
 Flowers in umbels, spikes, or racemes; the spikes or racemes
 sometimes paniced 738
738. Fruit fleshy **Araliaceæ**
 Fruit breaking up into 2 indehiscent mericarps **Umbellifereæ**
739. Ovary superior 740
 Ovary inferior 745
740. Corolla 2-lipped; stamens 2 **Lentibulariaceæ**
 Corolla regular or sub-regular; stamens 2 to many 741
741. Leaves bipinnate; ovary 1-chambered **Leguminosæ**
 Leaves pinnate or digitately compound; ovary 2-5-chambered 742
742. Ovary 2-4-chambered; stamens 2-5 743
 Ovary 5-chambered; stamens 10 **Oxalidaceæ**
743. Stamens 2 **Oleaceæ**
 Stamens 5 744
744. Small undershrubs, with pinnately divided leaves **Convolvulaceæ**
 Robust woody shrubs; leaves 3-foliolate **Bignoniaceæ**
745. Flowers solitary, fascicled, or inflorescence corymbose **Valerianaceæ**
 Flowers in heads **Dipsaceæ**

1. CYCADACEÆ.

Plants dioecious. *Male cones* 1 or more, terminal or sub-terminal, composed of an axis bearing numerous thickly coriaceous or fleshy flat or variously peltate scales (sporophylls), bearing on the under surface crowded 1-theccous pollen-sacs. *Female cones* terminal or sub-terminal, composed of an axis bearing flat or thickened variously peltate scales (sporophylls), or less often of flat blades crowded round the apex of the stem. *Ovules* large, sessile, solitary and inverted on either side of the peltate scale, or several and erect in notches along the margins of the blade. *Seed* large, drupaceous, with a more or less fleshy outer coat and a crustaceous or bony inner coat; endosperm copious; cotyledons 2.

Shrubs or small trees, with a thick simple rarely forking stem crowned with a terminal tuft of leaves, or stemless with the leaves arising from a tuberous simple or branched underground stem; leaves in alternate series of short coriaceous scales and of palm-like pinnate rarely 2-3-pinnate fronds, with membranous or coriaceous often marginally-toothed leaflets, which are usually many-nerved, with the nerves parallel, rarely anastomosing, sometimes 1-nerved.

Genera 9, with about 75 species, found mostly in Africa, Australia, and South America.

2

1. STANGERIA, T. Moore

Male cones cylindric; scales in many rows, densely imbricated, with pollen-sacs on the under surface. *Female cones* short, oblong-cylindric; scales in many rows, densely imbricated. *Ovules* sub-globose at the base of the scales. *Seed* globose, small.

Stem often subterranean; leaves few, long, petioled, pinnate; pinnae opposite or alternate, linear-lanceolate, obtuse, acute, sometimes acuminate, somewhat serrated or sub-crenate, rarely pinnatifid; cones peduncled, villous, surrounded at the base with 2-3 series of bracts.

A monotypic (?) endemic genus, extending from east of Port Alfred to Natal.

5.

2. ENCEPHALARTOS, Lchm.

Male cones oblong, ovoid, or cylindric; scales in many rows, imbricate, with pollen-sacs on the under surface. *Female cones* thick, ellipsoid or oblong; scales numerous, in many rows, imbricate. *Ovules* sessile, ovoid. *Seed* ellipsoid or oblong.

Trees with a cylindric trunk, or sometimes stem subterranean; leaves numerous, petioled, linear-oblong; leaflets sessile, rigid, entire, spinose or spinose-toothed; cones large, those of the male sometimes 2-3-nate.

An African genus of 17 species, 10 of which are natives of South Africa and extend from Uitenhage, through the eastern districts, into Natal and into the Transvaal; some are found in the more inland districts.

2. TAXACEÆ.

Plants diœcious, very rarely monœcious. *Male cones* mostly catkin-like, sometimes externally only slightly differentiated from the vegetative branches, simple or compound, terminal or axillary, solitary or fascicled, bracteate or ebracteate at the base; fertile scales bearing basi-dorsally 2-8 pollen-sacs, squamiform or more or less differentiated into a claw or stalk and a blade; blade large and projecting beyond the pollen-sacs, or transverse to the stalk (peltate), or very much reduced, when the scales with their pollen-sacs assume the appearance of typical angiospermous stamens. *Female cones* usually much reduced, terminal or axillary; lower scales barren, the upper or only the uppermost fertile, always simple, each bearing 1 ovule (very rarely 2), or all barren and supporting a solitary terminal ovule. *Ovules* usually more or less exceeding its scale, sometimes long-exserted, rarely quite enclosed by the cone. *Mature cones* usually little altered, or the axis or also the scales becoming more or less fleshy. *Seed* usually exserted; testa coriaceous to woody, with or without an outer covering (epimatium) which is either free or more or less fused with the testa and varies from membranous to leathery or fleshy.

Shrubs or trees; leaves usually spirally arranged, scale-like, or linear to lanceolate, rarely ovate, always evergreen.

Genera 10, with over 100 species, mostly in the tropics and southern temperate zone; few in the northern hemisphere.

13.

1. PODOCARPUS, L'Her.

Plants diœcious, very rarely monœcious. *Male cones* usually axillary, bracteate at the base, sessile or peduncled; scales numerous, spirally arranged, with 2 pollen-sacs near the base. *Female cones* terminal or axillary, usually reduced to a few sterile lower scales—which are more or less fused with each other and the axis and the whole plexus becoming ultimately fleshy—(receptacle) and 1 or 2 terminal fertile scales, rarely spike-like with few to numerous usually distant fertile scales; scales spirally arranged or opposite in decussate pairs. *Ovules* solitary, adnate to the face of the fertile scale and usually much exceeding it, inverted and enclosed in a false aril (epimatium) arising from the face of the scale and adnate to the single integument. *Seed* deciduous together with the modified (receptacle) or unmodified remainder of the cone, or falling from the scales of its persistent axis; testa and false aril (rarely also the fertile scale) forming a coriaceous or externally fleshy and internally woody shell. *Cotyledons* 2.

Shrubs or trees; leaves squamiform, or linear, or lanceolate to ovate, usually spirally arranged, rarely opposite; male cones solitary, or clustered, or disposed in compound inflorescences, rarely apical; seeds and receptacles, where present, greenish or brown, or sometimes vividly coloured, the former always conspicuously exposed.

Species about 60, mostly in the mountain forests of the tropics; a few in the temperate regions of the southern hemisphere and in Japan; 4 species found in South Africa, extending from Natal along the coastal belt into the Cape Peninsula.

3. PINACEÆ.

Plants diœcious or monœcious. *Male cones* mostly catkin-like, terminal, mostly solitary, rarely spicate, bracteate or ebracteate at the base; scales bearing basi-dorsally 2-15 pollen-sacs, squamiform or more or less differentiated into a claw or stalk and a variously modified and often much reduced blade. *Female cones* terminal or axillary; scales very numerous or few, sometimes only part of them fertile, simple, or with a scale- or ligule-like supra-basal appendage (ovuliferous scale) on the upper side; the fertile scales bearing 1-8 ovules direct or on the ovuliferous scale. *Ovules* erect or more often inverted, always shorter than their scales and covered by them; integument 1. *Mature cones* mostly developed as typical "cones" with enlarged hardened scales, or the scales proper arrested and their appendages enlarged, more rarely the mature scales fleshy and the cone, owing to their fusion, berry-like. *Seed* always enclosed, winged by the adhesion of a portion of the ovuliferous scale, or by wing-like expansions of the testa; testa crustaceous to woody without any appendage.

Shrubs or trees; leaves spirally arranged or in whorls, needle-like, or linear, or lanceolate to ovate, or squamiform.

Genera 25-30, with 250-300 species, mostly in the temperate zone of the northern hemisphere.

38

1. WIDDRINGTONIA, Endl.

Plants diœcious. *Male cones* small, terminal, solitary, sessile; scales decussately opposite, rhomboid-deltoid, produced into an upward decreasing beak, with 2-6 pollen-sacs at the base. *Female cones* small, axillary, sessile, in lax or in dense sometimes much reduced and short spikes, scattered along elongated shoots; scales opposite in 2 alternating pairs, divaricate at the time of pollination, then closing up, corky-coriaceous, apiculate. *Ovules* 5 or more at the base of each scale, erect. *Mature cones* woody,

ovoid or globose, opening with 4 very thick erect valves corresponding to the 4-scales. *Seeds* few, erect, ovoid or 3-angled; testa hard, winged; cotyledons 2.

Evergreen trees or shrubs; leaves passing from a spiral arrangement in the juvenile state and long shoots to a strictly decussate arrangement in the adult state, acicular in the juvenile form, squamiform and tightly appressed in the adult; cones the size of small plums, usually in lateral clusters.

An African genus of 5 species, 4 of which are found in South Africa, extending from the northern Transvaal, Natal, to the Cedarberg Mountains in Clanwilliam.

4. GNETACEÆ.

Plants monoecious or dioecious. *Florets* (flowers) diclinous or pseudo-bisexual. *Male florets* with an envelope formed of 1 pair or 2 decussating pairs of scales, free or united. *Stamens* 1—8; filaments connate at the base around a central superior barren ovule, or 0; anthers sometimes sessile or sub-sessile on the summit of a stout central axis. *Female florets* with an ovary-like utricule. *Ovules* naked, erect, orthotropous, with a single integument produced into an elongated tubular micropyle and protruding through the mouth of the utricule, with or without an aril. *Seed* endospermous, enclosed at maturity in the hardened utricule, which is either differentiated into a fleshy outer and a hard inner layer or entirely coriaceous and sometimes 2-winged; embryo straight, with 2 rarely 3 cotyledons.

Erect or scandent virgate or leafy shrubs, trees, or woody climbers, or a woody plant of unique form consisting of a stout tuberous hypocotyl and an early arrested depressed stem apex; leaves 2 or more, opposite, rarely in whorls of 3, simple; flowers in spikes.

Genera 3, with 50–60 species, mainly in the tropics and sub-tropics of both hemispheres.

48

1. WELWITSCHIA, Hook. f.

Plant dioecious. *Male florets* with an envelope of 2 imbricating whorls. *Stamens* 6, exserted; filaments connate into a very short tube at the base; anthers somewhat 3-lobed when mature, 3-theous, opening by 3-slits. *Female florets* with an utricule of 2 laterally placed connate leaves, bottle-shaped, contracted at the throat, with 2 lateral membranous wings. *Ovules* solitary, terminal, erect, with the single integument produced into a straight micropylar tube through the mouth of the utricule. *Seed* flattened, closely invested by the winged utricule.

Plant body woody, covered by thick corrugated cork, almost acaulescent; leaves 2, rarely 3, oblong, entire, usually torn into few or many strap-like segments in old plants; spikes arranged in compound dichasial cymes, rarely solitary.

Species 1, found in Angola and South-West Africa.

5. TYPHACEÆ.

Plants monœcious. *Flowers* unisexual. *Male flowers*: *Perianth* 0, or of 3—6 scales, or slender narrowly clavate threads, or spatulate or cuneate scales intermingled with the flowers. *Stamens* 2—7; filaments free or connate. *Ovary* 0. *Female flowers*: *Perianth* of scales or fine hairs, sometimes accompanied by slender spatulate or clavate bracteoles. *Ovary* superior, sessile or stalked, 1-chambered, with a solitary pendulous ovule; style simple, terminal, persistent; stigma simple, elongate. *Fruit* sessile or stalked; pericarp thin or thick. *Seed* endospermous; embryo cylindric.

Perennial aquatic or marsh herbs, with creeping rhizomes ; leaves alternate, in two ranks, linear or strap-shaped, sheathing at the base ; inflorescence a dense globose head or cylindric spike ; male inflorescence terminal ; flowers minute.

Genera 2, species about 25, very widely dispersed.

49

1. TYPHA, Linn.

Male flowers irregularly intermingled with variously shaped scales, or slender clavate curved threads. *Stamens* with their filaments variously connate ; connective of anthers produced beyond the thecae. *Female flowers* ebracteolate or mingled with slender clavate or spatulate bracteoles, and often with abortive clavate female flowers mixed with them. *Perianth* composed of several very fine simple or clavate hairs. *Ovary* stalked, at least after fertilization, narrow ; style elongate, slender, erect ; stigma linear or lanceolate. *Fruit* minute, stalked, ellipsoid. or sub-cylindric. *Seed* sub-cylindric or narrowly ellipsoid.

Aquatic or marsh herbs, with creeping rhizomes and erect stems ; leaves alternate, in two ranks, linear or strap-shaped ; flowering-stem erect, simple, terminated by the dense cylindric superposed unisexual flower-spikes ; floral-bracts 0, or linear and deciduous, or caducous.

Species about 18, widely distributed ; 2 species are found in South Africa wherever swamps occur ; found even in the Kalahari.

6. POTAMOGETONACEÆ.

Flowers bisexual or unisexual, regular. *Perianth* simple and little developed, or wanting. *Stamens* 1—4 ; anthers sessile. *Carpel* 1, with a 1-chambered ovary, or carpels several, distinct or almost so, with a solitary pendulous or laterally fixed ovule in each ovary, very rarely ovules 2. *Fruit* with a succulent or membranous pericarp, 1-seeded, indehiscent. *Seed* without endosperm.

Perennial aquatic herbs, generally submerged, sometimes with long-stalked floating leaves.

Genera 9, species about 75.

- | | |
|--|--------------------------------|
| 1. Flowers bisexual ; stamens 2 or 4 | 2 |
| Flowers unisexual ; stamen 1 | 3 |
| 2. Perianth-segments 4 ; stamens 4 | 2. <i>Potamogeton</i> , Linn. |
| Perianth none ; stamens 2 | 3. <i>Ruppia</i> , Linn. |
| 3. Gynæcium of 1 carpel ; perianth 0 | 1. <i>Zostera</i> , Linn. |
| Gynæcium of 3—4 carpels ; perianth of scales, or cup-shaped in the female flower and absent from the male flower | 4 |
| 4. Perianth absent in male, cup-shaped in the female flower | 4. <i>Zannichellia</i> , Linn. |

Perianth of 1—3 scales in both sexes 5. *Althenia*, Prit.

55

1. ZOSTERA, Linn.

Flowers unisexual. *Perianth* none. *Male flowers* of a single sessile oblong laterally attached 1-thealous anther. *Female flowers* of a single carpel, laterally attached near the apex and produced above into a filiform 2-branched style, with a single pendulous ovule. *Fruit* an indehiscent pendulous nutlet. *Embryo* grooved.

Submerged marine plants, with dark ribbon-like leaves ; rootstocks matted, creeping ; stem compressed ; leaves sheathing ; stipules combining with the sheathing leaf base ; the male and female flowers on the membranous rachis of a spike enclosed in the sheathing base of the floral leaf.

Species about 4, on the coasts of Europe, Asia, America, and Australia ; 2 species found in South Africa, inhabiting lagoons.

58

2. POTAMOGETON, Linn.

Flowers bisexual. *Perianth-segments* 4, green, valvate. *Anthers* 4, sessile. *Carpels* 4 (many abortive), sessile, with a single ovule in each ovary; stigma persistent, sub-sessile or decurrent, altering much in position in ripening. *Fruit* a small drupe. *Seed* reniform.

Submerged water plants, with creeping root-stocks; leaves terete or compressed, often floating, alternate or opposite, entire or toothed; stipules intrafoliaceous, free or adnate to the petiole; inflorescence a spike, with the peduncle surrounded at the base with a membranous sheath; flowers small, ebracteate.

Species about 60-70, cosmopolitan; 11 species recorded from South Africa, extending from the south-western part of the Cape Province to Natal, the Transvaal, and to many inland centres where vleis occur.

59

3. RUPPIA, Linn.

Flowers bisexual. *Perianth* none. *Stamens* 2; anthers 2-theous. *Carpels* 4, 1-ovuled; stigma sessile. *Fruit* of four long-stalked ovoid or oblique-ovoid achenes on a common peduncle. *Seed* uncinat.

Submerged slender brackish-water plants; leaves elongate, filiform, with a stipuliform sheath; flowers small, usually 2 together (2-6) within the leaf-sheath on a short peduncle, which mostly elongates and becomes straight or spirally twisted.

Probably a monotypic genus, found in temperate and tropical regions; recorded from the Cape Peninsula and Uitenhage.

62

4. ZANNICHELLIA, Linn.

Flowers unisexual. *Male flowers*: *Perianth* none. *Stamens* 1; filament slender; anther 2-4-theous. *Female flowers*: *Perianth* membranous, cup-shaped, undivided. *Carpels* usually 4, with a solitary pendulous ovule in each ovary; style long or short; stigma peltate, crenate. *Fruit* of 4, rarely less or more, long incurved achenes. *Seed* pendulous; embryo sub-cylindric, with the cotyledonary end twice folded on itself.

Slender submerged fresh-brackish or salt water plants; leaves mostly opposite, linear or capillary, with stipular sheaths; flowers small, in pairs or solitary.

Species 4 or 5 (perhaps all forms of a single species), in temperate and tropical regions; 2 species recorded from South Africa, 1 from the Cape Peninsula, the other from Little Namaqualand and Griqualand West.

63

5. ALTHENIA, Petit.

Flowers unisexual. *Male flowers*: *Perianth* of 3 minute scales. *Stamen* 1. *Female flowers*: *Perianth* of 1-3 narrow hyaline entire or cut segments. *Gynæcium* of 3 carpels, with a solitary pendulous ovule in each ovary; styles filiform, gradually passing into the carpels; stigmas large, oblique, capitate. *Mature carpels* lanceolate or oblong, compressed, with a thickened or winged margin. *Seed* pendulous, oblong, compressed; embryo straight.

Aquatic herbs; leaves congested at the nodes, setaceous, dilated at the base, with the expanded portion produced into a broad concave ligule; flowers minute.

Species 2, natives of Southern Europe; 1 species recorded from near Redhouse in the Uitenhage district.

7. NAIADACEÆ.

Flowers unisexual. *Perianth* none. *Male flowers* consisting of one terminal stamen enveloped in a close-fitting sac-like perianth, the whole being enclosed in a bottle-shaped spathe. *Female flowers* of a naked 1-chambered ovary, with a single basal ovule and with 2—3 stigmas. *Fruit* a drupe. *Seed* without endosperm.

Aquatic plants found in fresh or brackish water; leaves opposite, linear, toothed or spiny, sheathed at the base; flowers axillary, solitary or in glomerules.

Only one genus represented, with about 30 species, found in temperate and tropical regions.

64

1. NAIAS, Linn.

Characters of the family. One species recorded from the Transvaal.

8. APONOGETONACEÆ.

Flowers bisexual. *Perianth* of 1—3 equal or unequal segments, or 0. *Stamens* 5—6 or more. *Gynæcium* of 3—8 distinct carpels, with 2—8 basal ovules in each ovary. *Fruit* of 3 or more hardened foliicles. *Seeds* erect, without endosperm.

Aquatic plants, with tuberous rootstocks; leaves either floating or erect, variable in shape; scape with simple or bifid sessile spikes of unilateral or distichous flowers; the young flowers enclosed in a deciduous sheath.

Only one genus represented with about 20 species, found in Asia, Africa, and Australia.

65

1. APONOGETON, Thunb.

Characters of the family. Nine species in South Africa found where vleis occur, from the Cape to Natal and the Transvaal as well as in some inland districts.

9. JUNCAGINACEÆ.

Flowers usually bisexual. *Perianth* sepaloid, of 6 segments in two whorls. *Stamens* 6, in two whorls. *Ovary* 3—6-chambered, with a single basal ovule in each chamber; stigmas sessile or sub-sessile. *Fruit* of 3 or 6 free or connate achenes or foliicles with recurved tips. *Seed* erect, without endosperm.

Marsh herbs; leaves linear, with axillary scales; inflorescence a terminal raceme or spike.

Genera 4, with about 10 species, found in the temperate regions of the Old and New Worlds.

66

1. TRIGLOCHIN, Linn.

Perianth-segments 3 or 6, herbaceous, deciduous. *Stamens* 3—6, at the base of the perianth-segments and falling with them. *Carpels* 3—6 (3 often imperfect); ovary 1-chambered, with 1 ovule; styles short, sometimes connate; stigmas sessile or sub-sessile, plumose. *Fruit* of 3—6 free or connate foliicles with recurved tips, or of achenes breaking away from a 3-winged persistent axis. *Seed* erect; embryo straight.

Marsh herbs, with flat or terete leaves; inflorescence a raceme or spike; flowers 2-bracteate.

Species about 12, in the temperate regions of both worlds; several species occur in Australia, and 3 species in South Africa, extending from the Cape Peninsula to Natal.

10. ALISMATACEÆ.

Flowers regular, bisexual or unisexual, or unisexual with occasional bisexual flowers. *Sepals* 3. *Petals* 3, rarely absent in the female flowers. *Stamens* 6 or more, rarely 3; anthers opening outwards. *Gynæcium* of 6 or more (rarely 3) distinct carpels, or the carpels sometimes united at the base; ovule 1, rarely 2 or more, in each ovary, inverted. *Seed* without endosperm.

Aquatic or marsh herbs, with milky juice; leaves with axillary scales; inflorescence a panicle, or flowers whorled on elongated panicles.

Genera about 9, with about 15 species, natives of tropical and North Africa.

77

1. RAUTANENIA, Buch.

Flowers unisexual. *Sepals* persistent. *Petals* marcescent. *Male flowers*: *Stamens* 7—9, hypogynous, more or less connate. *Carpels* abortive. *Female flowers*: *Stamens* abortive. *Carpels* 7—9, sometimes not all fertile, with a solitary ovule in each ovary. *Fruits* herbaceous, irregularly capitate.

Glabrous perennial herbs; leaves erect, petioled; inflorescence a panicle. Endemic; species 1, found in South-West Africa.

11. HYDROCHARITACEÆ.

Flowers usually unisexual. *Perianth* regular, 2- (rarely 1-) seriate, 3-merous; the inner whorl petaloid, white or yellow. *Stamens* 3-12, inserted at the base of the perianth, free or slightly united at the base; staminodes sometimes present in the female flowers. *Ovary* inferior, 1-chambered, with 3-6-parietal placentas, 6-9-chambered, with many or few ovules; stigmas 3 on the 1-chambered ovaries or 6 on the several-chambered ovaries, usually bifid. *Fruit* various, often fleshy and indehiscent. *Seed* without endosperm; embryo straight.

Floa ing or submerged usually perennial herbs; leaves either allradical, or cauline and alternate, opposite or whorled; flowers when in bud enclosed in a membranous or herbaceous sessile or stalked spathe; the male usually numerous the female solitary.

Genera about 14; species about 50, extending through the tropical and temperate regions of both hemispheres.

Tribe *Thalassieæ*: Maritime herbs, submerged. (genus 1).

Tribe *Hydrilleæ*: Submerged or floating fresh water herbs; stem elongated, leafy; leaves somewhat elongated; spathe small, sessile in the leaf-axils; placentas somewhat prominent. (genera 2-3).

Tribe *Stratioteæ*: Submerged or floating fresh water herbs; stem very short; leaves crowded, some sessile and submerged, some long-petioled with floating laminas; spathe peduncled; ovary divided into 6 almost perfect chambers; placentas strongly intruded, 2-armed. (genus 4).

- | | |
|---|----------------------------------|
| 1. Flowers bisexual | 4. <i>Ottelia</i> , Pers. |
| Flowers unisexual | 2 |
| 2. Salt water herbs; male perianth in 1 row | 1. <i>Halophila</i> , Thouars |
| Fresh water herbs; male perianth double | 3 |
| 3. Male flower solitary in the spathe | 2. <i>Hydrilla</i> , L. C. Rich. |
| Male flowers many in each spathe | 3. <i>Lagarosiphon</i> , Harv. |

85

1. HALOPHILA, Thouars

Flowers unisexual. *Male flowers* pedicelled. *Perianth* 3-merous, in 1 row; segments sub-herbaceous. *Anthers* 3, sub-sessile, oblong-linear, alternating with the perianth-segments. *Ovary* 0. *Female flowers* sessile,

with 3 minute segments. *Ovary* 1-chambered, with a long beak ; styles 3, simple, long-filiform ; ovules attached to 3 parietal placentas. *Fruit* included in the spathe, sub-globose, crowned with a beak. *Seeds* many, sub-globose ; embryo thick.

Maritime herbs, submerged, with creeping stoloniferous stems and leafy at the nodes ; leaves sessile or petioled, oval or oblong, penninerved, apparently in pairs, with the petioles frequently enclosed at the base in 2 broad scales ; spathes sessile between the leaves, sessile, small.

Species about 4, found on the coasts of Africa, India, Australia, and the Pacific Islands ; 1 species in South Africa recorded from Port Al' red.

86

2. HYDRILLA, L.C.Rich.

Flowers unisexual. *Male flowers* shortly pedicelled. *Perianth* double, 3-merous ; outer segments ovate or obovate ; the inner segments narrower, scarcely longer. *Stamens* 3. *Ovary* 0. *Female flowers* sessile. *Perianth* with a long filiform tube above the ovary. *Staminodes* 0. *Ovary* 1-chambered, with 3-parietal placentas. *Fruit* cylindric, with few seeds.

Submerged herbs, with branching stems and short verticillate leaves ; spathes tubular, sessile in the axils of the leaves ; flowers solitary in the spathes.

A monotypic genus found in tropical and temperate regions of the Old World ; recorded from Natal and the Transvaal.

88

3. LAGAROSIPHON, Harv.

Flowers unisexual. *Male flowers* : *Perianth* 6-lobed ; the 3-outer lobes slightly larger than the 3 inner. *Stamens* 3 ; staminodes 2-3. *Female flowers* : *Perianth* 6-lobed ; tube very slender ; the 3 outer lobes slightly larger than the 3 inner. *Ovary* 1-chambered, with 3 parietal placentas ; style as long as the perianth-tube ; stigmas 3, sometimes forked.

Aquatic herbs, with more or less branched stems, leafy throughout ; leaves alternate, sub-opposite or whorled ; spathes axillary, solitary ; male spathe ovate, bifid at the apex, many-flowered ; female spathe ovate or oblong, 1-flowered.

Species about 12, chiefly in tropical Africa, 1 in the Mascarene Islands, and 1 in India ; a single species found in South Africa extending from Natal to Uitenhage, also in the Transvaal and the Orange Free State ; occurs also in tropical Africa.

95

4. OTTELIA, Pers.

Flowers bisexual, solitary and sessile in a tubular shortly 2-fid spathe. *Perianth* 3-merous, in 2 series above the beak of the ovary ; outer segments oblong or linear, rigidly membranous ; inner petaloid, much larger, broadly obovate or orbicular, with a fleshy appendage at the base. *Stamens* 6 to many ; filaments often flattened ; anthers erect, oblong or linear. *Ovary* oblong, more or less beaked, with the placentas strongly developed and dividing the ovary into almost 6 perfect chambers ; styles 6, linear, semi-2-fid ; ovules many. *Fruit* included in the spathe, 3-6-winged, oblong, attenuated at the apex. *Seeds* numerous, small, oblong.

Aquatic herbs, with very short stems ; leaves crowded, some with short petioles submerged, some with long petioles floating ; lamina ovate, oblong, or very broadly cordate ; scape elongated ; spathe herbaceous, many-nerved, strongly 2-6 ribbed.

Species 9 or 10, natives of tropical Asia, Japan, Australia, the Mascarene Islands, Brazil, and tropical Africa ; 1 species recorded from the Transvaal.

12. GRAMINEÆ.

Plants rarely monœcious. *Flowers* bisexual or unisexual. *Perianth*, 0, or represented by minute scales (lodicules). *Stamens* usually 3, more rarely 6, 4, 2, or 1; filaments very slender, almost always free; anthers versatile, 2-theous, usually opening by longitudinal slits. *Ovary* superior, 1-chambered, with a solitary ovule; styles usually 2, rarely 3 or 1, free or united at the base, usually terminal on the ovary; stigmas as many as the styles, usually plumose. *Fruit* a caryopsis, with the pericarp adnate to the seed, rarely the seed free within the pericarp, frequently remaining enclosed within the bracts of the inflorescence. *Seed* with starchy or chitinous endosperm; embryo usually small; hilum distinct.

Usually annual or perennial herbs, rarely suffruticose, or tall shrubs, or trees; stem (*culm*) simple or branched, usually cylindric and hollow and with distinct nodes; in the perennial species the culm arising as an innovation shoot which either pierces the subtending sheath (*extravaginal*) or grows up inside the sheath (*intravaginal*); leaves usually 2-ranked, consisting of a blade and usually a split sheath, at the junction of the blade and sheath is usually a ciliate rim or membrane (the *ligule*); the unit of inflorescence (the *spikelet*) consists of a short axis (the *rhachilla*) bearing bracts which are either empty or subtend flowers; the lowermost bracts (*glumes*) invariably 2, empty; the succeeding bracts (*valves*) 1 to many, subtending flowers and usually a bracteole, or empty; the bracteole (*pale*) on a minute branch of the rhachilla, subtended by a valve, invariably 2-keeled, sometimes reduced or absent; spikelets rarely solitary, usually massed into various types of inflorescence at the end of the culm.

Genera about 500; species over 3,000, found in all parts of the world.

A.—Spikelets 1-flowered (rarely 2-flowered, but if so then the lower flower imperfect), falling from the peduncle of entire or together with internodes of the rhachis; rhachilla not produced beyond the valve, with indistinct internodes.

I. Spikelets not laterally compressed, but usually dorsally compressed or else terete; hilum punctiform.

Tribe **Andropogoneæ**: Pale (often wanting) and valve subtending the fertile flower hyaline; lower glume larger than the upper; spikelets generally in racemes or spikes; rhachis disarticulating at maturity; the internodes falling with the spikelets (genera 1-22).

Tribe **Zoysieæ**: Pale and valve subtending the fertile flower membranaceous; lower glume generally larger than the upper; spikelets falling singly or in groups (genera 23-26).

Tribe **Tristegineæ**: Pale and valve subtending the fertile flower membranaceous; glumes herbaceous or chartaceous; the lower smaller and narrower than the upper; spikelets falling singly (genera 27-28).

Tribe **Panicææ**: Pale and valve subtending the fertile flower cartilaginous, coriaceous, or chartaceous; lower glume absent, minute, or smaller than the upper; spikelets falling singly (genera 29-47).

II. Spikelets laterally compressed; hilum linear.

Tribe **Oryzeæ**: (genera 48-50).

B.—Spikelets 1 to many-flowered, with the rhachilla disarticulating above the glumes which persist; rhachilla in the 1-flowered spikelets frequently produced beyond the valve, with distinct internodes in the 2 to many-flowered spikelets.

1. Culm herbaceous, annual; leaf-blade sessile, not articulated with the sheath.

Tribe **Phalarideæ**: Spikelets not in 2 rows and secund, nor distichous, 1-flowered; valves usually 3 (genera 51-53).

Tribe **Agrostideæ**: Spikelets not in 2 rows and secund, nor distichous, 1-flowered; valve 1 (genera 54-62).

Tribe **Aveneæ** : Spikelets not in 2 rows and secund, nor distichous, 2 to many-flowered; valves usually shorter than the glumes, when awned then awn usually from the back of the valve (genera 63-76).

Tribe **Chloridæ** : Spikelets in 2 rows, secund, 2 to many-flowered. (genera 77-91).

Tribe **Festuceæ** : Spikelets not in 2 rows and secund, nor distichous, 2 to many-flowered; valves usually exceeding the glumes, when awned then awn from the tip of the valve (genera 92-119).

Tribe **Hordeæ** : Spikelets distichous, 2 to many-flowered (genera 120-125).

II. Culm (at least at the base) woody; leaf-blade often articulated with the sheath.

Tribe **Bambuseæ** : (genera 126-127).

1. Culm woody, at least at the base (bamboos) 2
- Culm not woody 3
2. Culm slender, about 5 mm. diameter 126. *Arundinaria*, *Linn.*
- Culm robust, about 2 cm. in diameter 127. *Bambusa*, *Schreb.*
3. Plants producing bulbils on the inflorescence (viviparous) 113. *Poa*, *Linn.*
- Plants not viviparous 4
4. Inflorescence solitary at the end of each unbranched flowering culm, either a true spike, or very compact so that it appears spike-like, more rarely the spikelet terminal and solitary 5
- Inflorescence variously branched, but never solitary and spike-like at the end of an unbranched flowering culm 85
5. Spikelet solitary and terminal 119. *Brachypodium*, *Beauv.*
- Spikelets massed in an inflorescence 6
6. Spikelets enclosed in an involucre covered with stout rigid spines, or spikelets bristly with cartilaginous bristles, or hairy from bulbous-based hairs, or surrounded at the base with an involucre of 1 or more bristles 7
- Spikelets glabrous, or hairy, or scabrid, but not as above, rarely with the keel of the glumes mucronate-pectinate 15
7. Spikelets with bulbous-based hairs 8
- Spikelets spiny, bristly, or surrounded by an involucre of 1 or more bristles 11
8. Spikelets densely villous 23. *Anthephora*, *Schreb.*
- Spikelets not villous 9
9. Uppermost leaf-blade overtopping the inflorescence 95. *Urochloa*, *Nees*
- Inflorescence exerted from the uppermost leaf-sheath 10
10. Spikelets strongly compressed, elliptic to ovate in outline, 2-ranked 105. *Demazeria*, *Dumort*
- Spikelets not strongly compressed nor 2-ranked 107. *Lasiachloa*, *Kunth*
11. Spikelets bristly or enclosed in a spiny involucre 12
- Spikelets with an involucre of 1 or more bristles 14
12. Spikelets enclosed in a spiny involucre 44. *Cenchrus*, *Linn.*
- Spikelets covered with cartilaginous bristles 13
13. Lower glume absent or represented by a small seale; upper glume not produced into a long fine acumen 24. *Tragus*, *Haller.*
- Both glumes developed and sub-equal; both produced into a long fine acumen 107. *Lasiachloa*, *Kunth*
14. Mature spikelets falling without the bristles 43. *Setaria*, *Beauv.*
- Mature spikelets falling with the bristles 45. *Pennisetum*, *Pers.*
15. Valve 2-9-awned, or the awn 3-partite 16
- Awn when present solitary and simple 24
16. Valve 2-3-awned, or the awn 3-partite 17
- Valve 5-9-awned 22
17. Valve 1 18
- Valves 2 or more 20
18. Glumes sometimes shortly awned but never with long capillary or plumose awns 54. *Aristida*, *Linn.*
- Glumes with long capillary awns, or awns plumose 19

19. Awns of glumes plumose 62. *Lagurus*, Linn.
Awns of glumes not plumose 59. *Polypogon*, Desf.
20. Valves 2 75. *Pentastachstis*, Stapf
Valves 3 or more 21
21. Main rhachis not branched 73. *Danthonia*, DC
Main rhachis branched 94. *Triraphis*, R.Br.
22. Glumes 1-nerved 75. *Pentastachstis*, Stapf
Glumes distinctly 3-11-nerved 23
23. Valves 7-9-awned; fertile valve 1. 92. *Enneapogon*, Desv.
Valve 5-awned; fertile valves 3-5 93. *Schmidtia*, Steud.
24. Spikelets distinctly awned, or the valves or glumes distinctly mucronate, or long and sharply acuminate 25
Spikelets not awned, nor valves nor glumes mucronate or acuminate, rarely with a short awn hidden by the glumes and not readily visible 55
25. Spikelets fascicled, fertile and sterile; rhachilla of sterile spikelets very evident to the naked eye 110. *Cynosurus*, Linn.
Spikelets all fertile, more rarely fertile and male; rhachilla not evident 26
26. Spikelets in groups of 3; glumes represented by 2 long awns; sometimes the lateral spikelets much reduced so that the central spikelet appears to have 2 awns arising from its pedicel 125. *Hordeum*, Linn.
Spikelets solitary or 2-nate, rarely in clusters of 4-5 27
27. Glumes acuminate, generally 2-partite, not produced into distinct bristle-like awns; valves not awned, rarely pungent mucronate 28
Awns from the glumes or valves very distinctly bristle-like 31
28. Valves or glumes pungent-mucronate or acuminate 29
Valves or glumes not pungent, if pungent then spikelets in groups of 4-5 30
29. Spikelets 1 cm. or more broad, much compressed 86. *Entoplocamia*, Stapf
Spikelets less than 0.5 cm. broad 87. *Dinebra*, Jacq.
30. Spikelets 2-nate 10. *Elionurus*, Humb. & Bonpl.
Spikelets in clusters of 4-5 23. *Anthephora*, Schreb.
31. Both glumes passing into capillary awns; main axis unbranched 26. *Perotis*, Ait.
Very rarely both glumes with long capillary awns, but if so then main axis branched 32
32. Spikelets 2-nate, usually one solitary and the other peduncled, rarely both peduncled 33
Spikelets solitary, sessile or peduncled 38
33. Spikelets very unequally peduncled; nodes of culm with a distinct ring of hairs 9. *Trachypogon*, Nees
One spikelet sessile; the other peduncled; nodes of culm rarely with a distinct ring of hairs 34
34. Awn 6 times or more as long as the spikelet 35
Awn less than 6 times as long as the spikelet 36
35. Awns separate, erect-spreading 7. *Urelytrum*, Hack.
Awns erect and twisted together at the top of the inflorescence 21. *Heteropogon*, Pers.
36. Glume of peduncled spikelet almost 3 mm. broad 6. *Sehmia*, Forsk.
Glume of peduncled spikelet less than 1 mm. broad 37
37. Peduncle shorter than the glume (excluding the awn) 11. *Andropogon*, Linn.
Peduncle as long as or slightly longer than the glume (excluding the awn) 17. *Schizachyrium*, Nees
38. Glume awned from the middle of the back 81. *Ctenium*, Panz.
Glume if awned not from the middle of the back 39
39. Awns several from each spikelet 40
Awns 2-3 from each spikelet, rarely awn solitary 47
40. Main rhachis of inflorescence not branched, but carrying the spikelets direct 41
Main rhachis branched forming a very contracted panicle 44

41. Spikelets not 2-ranked on the central axis 96. *Fingerhuthia*, *Nees*
Spikelets 2-ranked 42
42. Spikelets 3-5 mm. long 84. *Tripogon*, *Rott.*
Spikelets 1-4 cm. long (excluding the awn) 43
43. Both glumes present 119. *Brachypodium*, *Beauv.*
Lower glume absent in the lateral spikelets; both present in the
terminal spikelet 120. *Lolium*, *Linn.*
44. Inflorescence finely villous or pilose 45
Inflorescence scabrid, pubescent, or glabrous 46
45. Valves 2-lobed; awned from the sinus 73. *Danthonia*, *DC.*
Valves not 2-lobed; awned from the tip 101. *Leptocarydion*, *Hochst.*
46. Spikelets fertile and sterile; the fertile spikelets hidden by the
persistent sterile spikelets 110. *Cynosurus*, *Linn.*
Spikelets all fertile 116. *Vulpia*, *Gmel.*
47. Awn solitary from each spikelet 48
Awns 2-3 from each spikelet 50
48. Main rhachis simple; spikelets distichous 105. *Demazeria*, *Dumort*
Main rhachis branched; spikelets not distichous 49
49. Valve enveloped in long hairs 61. *Calamagrostis*, *Roth.*
Valve not enveloped in long hairs 60. *Agrostis*, *Beauv.*
50. Main rhachis not branched 51
Main rhachis branched 52
51. Spikelets villous; ligule a fringe of hairs 96. *Fingerhuthia*, *Nees*
Spikelets scabrid; ligule membranous 124. *Secale*, *Linn.*
52. Spikelets densely villous; hairs hiding the awns 40. *Tricholæna*, *Schrad.*
Spikelets not densely villous; awns evident 53
53. Glumes awned 59. *Polypodon*, *Desf.*
Valves awned 54
54. Awn from the back of the valve 53. *Anthoxanthum*, *Linn.*
Awn from between the lobes of the valve 73. *Danthonia*, *DC.*
55. Keel of glumes muricate-pectinate 64. *Prionanthium*, *Desv.*
Keel of glumes not muricate-pectinate 56
56. Main rhachis branched; the branches sometimes hidden by the
spikelets but then the glumes broadly winged 57
Main rhachis not branched, very rarely branched, but then the
branches so pressed against the rhachis that they are not easily
observed 68
57. Inflorescence villous, or spikelets long-ciliate 58
Inflorescence glabrous or scabrid 63
58. Spikelets generally 2-nate; 1 sessile, the other peduncled 1. *Imperata*, *Cyr.*
Spikelets solitary 59
59. Spikelets sessile 103. *Koeleria*, *Pers.*
Spikelets peduncled 60
60. Leaves arranged alternately up the culm; leaf-blades more or less
awl-shaped 99. *Diplachne*, *Beauv.*
Leaves all basal; leaf-blades long, terete 61
61. Glumes glabrous; nerves distinct 112. *Schismus*, *Beauv.*
Glumes hairy; nerves not visible 62
62. Culm hairy just below the inflorescence; inflorescence covered
with white or pink hairs 40. *Tricholæna*, *Schrad.*
Culm glabrous below the inflorescence; spikelets dark-coloured,
sparsely villous with white hairs 108. *Stiburus*, *Stapf*
63. Ligule membranous, evident 64
Ligule a fringe of hairs 66
64. Glumes winged, with evident marginal nerves; 2 lowest valves
empty, much reduced or suppressed; uppermost valve with a
fertile flower 52. *Phalaris*, *Linn.*
Glumes not winged; marginal nerves obscure; flowers 1-4, if more
than 1 then the lower valves subtending the fertile flowers 65
65. Spikelets 2-4-flowered 103. *Koeleria*, *Pers.*
Spikelets 1-flowered 60. *Agrostis*, *Beauv.*
66. Spikelets distichous on the rhachis, compressed, ovate or elliptic
in outline, 7-9-flowered 105. *Demazeria*, *Dumort*
Spikelets not distichous, nor compressed, nor ovate, 1-2-flowered 67

67. Spikelets 2-flowered, tinged with purple, or peduncle arising from a swelling on the rachis, or main rachis with scattered glands
75. *Pentaschistis*, Stapf
Spikelets 1-flowered, uniform olive-green in colour; rachis without swellings or glands 58. *Sporobolus*, R.Br.
68. Spikelets solitary, distinctly distichous 69
Spikelets generally solitary, not distichous, very rarely (in *Hemarthria*) 2-nate and distichous 74
69. Glumes facing, or with their backs turned towards the hollow surface of the rachis 70
Glumes with their sides turned towards the hollow surface of the rachis 73
70. Both glumes developed 107. *Demazeria*, Dumort
Lower glume of lateral spikelets suppressed 71
71. Spikelet 1-flowered 72
Spikelet 4 to many-flowered 120. *Lolium*, Linn.
72. Inflorescence flattened 121. *Oropetium*, Trin.
Inflorescence cylindric 122. *Lepturus*, R.Br.
73. Spikelets scabrous 124. *Secale*, Linn.
Spikelets not scabrous 125. *Agropyrum*, Gaertn.
74. Spikelets villous or long-ciliate 75
Spikelets glabrous 77
75. Spikelets solitary, almost at right angles to the rachis
81. *Harpechloa*, Kunth
Spikelets 2-nate, more or less parallel with the rachis 76
76. Spikelets 3-4 mm. long, closely pressed to the rachis; glume more or less elliptic 37. *Digitaria*, Hall.
Spikelets 7-1 cm. long, standing away from the rachis; glumes lanceolate, usually acuminate 10. *Elionurus*, Humb. & Bonpl.
77. Valves evidently transversely rugose or tubercled 51. *Ehrharta*, Thunb.
Valves not transversely rugose 78
78. Spikelets orbicular in outline 29. *Paspalum*, Linn.
Spikelets lanceolate or linear-oblong in outline, sometimes subfalcate 79
79. Spikelets very closely adpressed to and in cavities on the rachis 80
Spikelets not closely adpressed to the rachis, or at least not in cavities of the rachis 82
80. Ligule a short membrane, rarely ciliate; visible glume closely nerved 8. *Hemarthria*, R.Br.
Ligule a fringe of hairs; visible glume not closely nerved 81
81. A prostrate creeping plant rooting at the nodes; leaf-blades 5 mm. or more broad 46. *Stenotaphrum*, Trin.
Small erect tufted plants; leaf-blades 2 mm. or less broad
64. *Prionanthium*, Desv.
82. Rachis not flattened; spikelets not 2-ranked 25. *Mosdenia*, Stent
Rachis flattened; spikelets 2-ranked 83
83. Ligule a fringe of hairs or minutely ciliate; nerves of glume not distinct 84
Ligule short, membranous; nerves of glume distinct 103. *Koeleria*, Pers.
84. Tufted plants; inflorescence falcate 77. *Microchloa*, R.Br.
Creeping plants; inflorescence straight 78. *Cynodon*, Pers.
85. Spikelets awned, or mucronate, or subtended by 1 or more bristles 86
Spikelets not evidently awned nor mucronate 189
86. Spikelets, or at least some of them, subtended by a bristle
43. *Setaria*, Beauv.
Spikelets not subtended by a bristle 87
87. Leaf-blades broadly ovate, arising alternately on the culm
47. *Olyra*, Linn.
Leaf-blades not broadly ovate, sometimes lanceolate, mostly basal 88
88. Valves evidently transversely rugose, or strongly compressed and minutely punctate, or spikelets with bulbous-based hairs, or keel of glume tubercled 89
Spikelets glabrous or hairy but not with bulbous-based hairs; valves not transversely rugose, at least not evident to the naked eye; keel of glume not tubercled 95

89. Valves transversely rugose, or strongly compressed and minutely punctuate, or keel of glume tubercled 90
 Spikelets with bulbous-based hairs 92
90. Valves transversely rugose or minutely punctate 91
 Keel of glume tubercled 75. *Pentaschistis*, *Stapp*
91. Valves transversely rugose 51. *Ehrharta*, *Thunb.*
 Valves much compressed and minutely punctate 49. *Oryza*, *Linn.*
92. Group of spikelets subtended by a green spathe 22. *Themeda*, *Forsk.*
 Spikelets not subtended by a green spathe 93
93. Spikelet 1-awned 94
 Apparent spikelet (really 3 spikelets) 3-awned 71. *Tristachya*, *Nees*
94. Spikelet 1-awned (the upper valve) 73. *Trichopteryx*, *Nees*
 Spikelet 2-awned (the upper glume and lower valve) 40. *Tricholæna*, *Schrad.*
95. Spikelets in groups of 3 at the end of a long peduncle ; spikelets all alike 71. *Tristachya*, *Nees*
 Spikelets not in groups of 3, very rarely 3-nate, but then the sessile spikelet bisexual and the 2 peduncled spikelets male or barren 96
96. Valves 3-9-awned, or awn 3-partite 97
 Awn solitary from each glume or valve, or valve with a long acumen, or glumes distinctly mucronate, or spikelets subtended by 1 or more bristles 105
97. Valve 3-awned, or awn 3-partite 98
 Valve 5-9-awned 104
98. Awn 3-partite ; spikelet 1-flowered 54. *Aristida*, *Linn.*
 Valve 3-awned ; spikelet 2-18-flowered 99
99. Main awn as long as or shorter than the valve 94. *Triraphis*, *R.Br.*
 Main awn longer than, usually twice as long as, the valve 100
100. Main awn from the back of the valve ; ovary pilose or villous 70. *Avenastrum*, *Jess.*
 Main awn from the tip or sinus of the valve ; ovary usually glabrous, more rarely with a tuft of branched hairs at the top 101
101. Spikelet 2-flowered 102
 Spikelet 3- or more-flowered 103
102. Ovary glabrous 75. *Pentaschistis*, *Stapp*
 Ovary with a tuft of branched hairs on the top 76. *Pentameris*, *Beauv.*
103. Peduncles articulated about the middle or above the middle, hairy at the articulation ; the upper portion falling with the spikelet ; lowermost valve usually without side awns 74. *Chæotobromus*, *Nees*
 Peduncles not articulated ; lowermost valve with side awns 73. *Danthonia*, *DC.*
104. Valve 9-awned ; spikelet with 1 fertile flower 92. *Enneapogon*, *Desv.*
 Valve 5-awned ; spikelets with 3-5-fertile flowers 93. *Schmidtia*, *Steud.*
105. Spikelets fascicled, fertile and sterile, with the internodes of the rhachilla of the sterile spikelets very evident to the naked eye and covered with empty valves 110. *Cynosurus*, *Linn.*
 Spikelets solitary, 2-nate, clustered, or very rarely 3-nate, sometimes the peduncled spikelet represented by a peduncle only ; rhachilla very rarely evident to the naked eye, but then spikelets peduncled and not fascicled 106
106. Branches of inflorescence long, filiform, arranged in whorls axis and bearing 3 spikelets (2 peduncled, 1 sessile) 14. *Chrysopogon*, *Trin.*
 Spikelets solitary or 2-nate, if 3-nate then spikelets all alike in sex, more rarely spikelets grouped to somewhat resemble a single spikelet 107
107. Whole inflorescence arranged digitately or sub-digitately at the end of the main culm ; the branches usually spike-like but not subtended by a spathe 108
 Inflorescence a panicle, raceme, or with spike-like branches arranged on the main axis or branches of the main axis (but not digitate), if digitate then the spike-like branches subtended by a green or reddish spathe and sometimes far exserted from the spathe 120

108. Spikeless 2-3-nate 109
 Spikelets solitary 116
109. Spikelets all peduncled ; peduncles more or less equal 110
 Spikelets 1 sessile (more rarely sub-sessile), the other peduncled 111
110. Awn about 7-8 times as long as the spikelet, hairy 9. *Trachypogon*, *Nees*
 Awn shorter than the length of the spikelet, glabrous 30. *Alloteropsis*, *Presl*.
111. Internode of rhachis more or less cup-shaped at the top ; tip of peduncle slightly produced on the inner face of the spikelet 11. *Andropogon*, *Linn*.
- Internode of rhachis not cup-shaped at the top ; peduncle not produced at the apex 112
112. Both spikelets awned 113
 Sessile spikelet awned ; peduncled spikelets awnless 114
113. One spikelet quite sessile 4. *Pollinia*, *Trin*.
 One spikelet sub-sessile 5. *Ischæmum*, *Linn*.
114. Peduncle concave-spathulate, bearing a single linear-lanceolate bract at the apex 5. *Ischæmum*, *Linn*.
 Peduncle linear, bearing a distinctly nerved glume or glumes 115
115. Peduncle more than $\frac{1}{2}$ the length of the sessile spikelet ; peduncled spikelet lanceolate, acute, glabrous or almost so ; glume of the sessile spikelet often with an evident pit 15. *Amphilophis*, *Nash*
 Peduncle less than $\frac{1}{2}$ the length of the sessile spikelet ; peduncled spikelet elliptic-oblong, obtuse, sparsely covered with long hairs ; glume of sessile spikelet without a pit 16. *Dichanthium*, *Willemet*.
116. Rhachis very evidently produced beyond the uppermost spikelets 89. *Dactyloctenium*, *Willd*.
- Uppermost spikelets sometimes reduced, but the rhachis not or only minutely produced beyond them 117
117. Spikelets arranged unilaterally on the rhachis 118
 Spikelets not arranged unilaterally on the rhachis 119
118. Upper glume not distinctly awned 82. *Chloris*, *Suartz*
 Upper glume with a prominent mid-rib which is produced into a distinct awn just below the apex 83. *Eustachys*, *Desv*.
119. Glumes ovate, prominently nerved ; awn stout, shorter than the spikelet 30. *Alloteropsis*, *Presl*.
 Glumes linear, not prominently nerved ; awns capillary, longer than the spikelet 90. *Lophachme*, *Stapf*
120. Groups of spikelets or the digitately arranged spike-like branches of the inflorescence, subtended by a spathe, the whole forming a spathulate panicle, sometimes spathe remote from the inflorescence 121
 Inflorescence not subtended by a spathe 126
121. Awn distinctly hairy 122
 Awn glabrous or almost so, sometimes scaberulous 123
122. Spikelets in spike-like racemes ; racemes usually in pairs and each pair supported by a spathe 19. *Hyparrhenia*, *Anders*.
 Spikelets appearing as if fascicled ; apparent spikelet really consisting of 1 fertile sessile spikelet, with 2 peduncled spikelets at the base, surrounded by a false involucre of 4 sessile spikelets ; the whole enclosed in a green spathe 22. *Themeda*, *Forsk*.
123. Sessile spikelet with 2 awns 20. *Monocymbium*, *Stapf*
 Sessile spikelet with a solitary awn 124
124. Peduncled spikelet represented by the peduncle only, or by the peduncle with a linear scale at the apex 11. *Andropogon*, *Linn*.
 Peduncled spikelet with well-developed glumes 125
125. Peduncle longitudinally grooved and hyaline in the groove 15. *Amphilophis*, *Nash*
 Peduncle not grooved nor hyaline 18. *Cymbopogon*, *Spring*.
126. Inflorescence spike-like, solitary and terminal on the branches of the culm, the whole forming a loose panicle 17. *Schizachyrium*, *Nees*
 Inflorescence an evident panicle, or raceme, or composed of spikes or spike-like racemes arranged up a central axis or branches of the central axis 127

127. Inflorescence of spikes, or spike-like racemes, arranged up a central axis or branches of a central axis 128
 Inflorescence an evident panicle or raceme, loose or compact, more rarely a spike 138
128. Spikelets or groups of spikelets very remote on the main axis; leaves short, lanceolate, arranged alternately up the culm
 42. *Oplismenus*, Beauv. 129
 Spikelets not as above; leaves mostly basal 129
129. Spikelets crowded on a very short flattened rhachis; the groups of spikelets being very closely packed resemble, at first sight, a single spikelet 87. *Dinebra*, Jacq.
 Spikelets not crowded on a very short rhachis 130
130. Awn or mucro solitary in each spikelet, sometimes more or less hidden by the long villous hairs 131
 Awns or mucros 2 to several in each spikelet 134
131. Rhachis much flattened 31. *Eriochloa*, H.B. & K.
 Rhachis not much flattened 132
132. Spikelets glabrous 27. *Arundinella*, Raddi.
 Spikelets hispid, pubescent, or villous 133
133. Spikelets hispid or pubescent 35. *Echinochloa*, Beauv.
 Spikelets villous 34. *Brachiaria*, Griseb.
 Spikelets peduncled 135
 Spikelets sessile 136
135. Ligule membranous, not ciliate 91. *Crossotropsis*, Stapf
 Ligule a fringe of hairs 99. *Diplachne*, Beauv.
136. Ligule membranous, not ciliate 109. *Dactylis*, Linn.
 Ligule ciliate 137
137. Small plants up to 6 in. high; leaf-blades almost filiform
 84. *Tripogon*, Rott.
 Robust plants over 1 ft. high; leaf-blades flat 86. *Entoplocamia*, Stapf
138. Apparent spikelet really a group of 3 spikelets at the end of a long common peduncle 71. *Tristachya*, Nees
 Spikelets distinct, more rarely clustered on short peduncles, but then the clusters remote on the main axis 139
139. Leaves arising alternately up the stem; blades lanceolate or long linear; spikelets remote on the main axis, or inflorescence a very large dense panicle 140
 Leaves mostly basal; blades not distinctly lanceolate; spikelets not remote on the main axis 141
140. Spikelets remote on the main axis 42. *Oplismenus*, Beauv.
 Inflorescence a large dense panicle 98. *Phragmites*, Trin.
141. Inflorescence a false spike 119. *Brachypodium*, Beauv.
 Inflorescence a panicle or raceme 142
142. Awns or mucros 2 or more from each spikelet, sometimes only 1 awn projecting beyond the glumes 143
 Awn or mucro solitary in each spikelet 171
143. Spikelets apparently 3-nate, but really 3 long linear awnless sterile spikelets which surround fertile awned spikelets
 111. *Lamarckia*, Moench.
 Spikelets solitary, very rarely (in *Ehrharta*) 2-nate 144
 Ligule ciliate or reduced to a fringe of hairs 145
 Ligule membranous, not ciliate 157
145. Peduncle articulated below the spikelet, usually bearded and plumose, or long villous at the articulation or at the base of the spikelet; spikelets falling entire 146
 Peduncle not articulated below the spikelet; glumes persistent 148
146. Spikelet with 2 valves, but only 1 fertile flower 147
 Spikelet with 3-4 valves and more than 1 fertile flower
 74. *Chaetobromus*, Nees
147. Spikelets usually villous with silky hairs 40. *Tricholæna*, Nees
 Spikelets pilose 28. *Melinis*, Beauv.
148. Awn from the back of the valve 149
 Awn from the tip or sinus of the valve 150
149. Glumes pubescent, 3-nerved 68. *Trisetum*, Pers.
 Glumes glabrous, 1-nerved 99. *Diplachne*, Beauv.

150. Lower valve (or 2 lower valves when 3 valves present) empty and different from the upper or uppermost valve 151
 Valves all similar 152
151. Valves 3; glumes more or less equal 51. *Ehrharta*, *Thunb.*
 Valves 2; lower glume very much smaller than the upper 40. *Tricholæna*, *Schrad.*
152. Valves shortly 2-toothed 153
 Valves distinctly 2-lobed 154
153. Glumes pubescent, 3-nerved 68. *Trisetum*, *Pers.*
 Glumes glabrous, 1-nerved 99. *Diplachne*, *Beauv.*
154. Valves 3 to many, the lower with fertile, the upper with more or less reduced flowers 155
 Valves 2, usually both with fertile flowers 156
155. Ligule a fringe of cilia 74. *Danthonia*, *D C.*
 Ligule membranous, minutely ciliate 99. *Diplachne*, *Beauv.*
156. Ovary glabrous 75. *Pentastichis*, *Stapf*
 Ovary hairy 76. *Pentameris*, *Beauv.*
157. Glumes, at least the upper, as long as or longer than the valves . . 158
 Glumes much shorter than the valves 166
158. Glumes very distinctly many-nerved or with very prominent keels and side nerves 159
 Glumes not distinctly many-nerved 161
159. Spikelets long-peduncled and nodding 69. *Avena*, *Linn.*
 Spikelets shortly-peduncled, not nodding 160
160. Valves 3; the 2 lower usually barren; the uppermost subtending a fertile flower 53. *Anthoxanthum*, *Linn.*
 Valves 2; the lower subtending a fertile flower; the upper barren or with a male flower 63. *Holcus*, *Linn.*
161. Two or more fertile flowers in each spikelet 162
 One fertile flower in each spikelet 164
162. A delicate annual; leaf-blades smooth 65. *Aira*, *Linn.*
 Perennials, about 0.6 m. high 163
163. Primary branches very distinctly whorled on the central axis . . . 67. *Deschampsia*, *Beauv.*
 Primary branches usually arising singly on the central axis 99. *Diplachne*, *Beauv.*
164. Both glumes with long capillary awns 59. *Polypogon*, *Desf.*
 Both glumes not awned, or the awns not capillary 165
165. Spikelet, at least the valves, villous 51. *Ehrharta*, *Thunb.*
 Spikelet glabrous or almost so 60. *Agrostis*, *Linn.*
166. Valves distinctly 2-lobed, with bristles from the lobes 70. *Avenastrum*, *Jess.*
 Valves very rarely distinctly 2-lobed, but if so the lobes without bristles 167
167. Spikelets villous on the valves only, or the valves scabrid 51. *Ehrharta*, *Thunb.*
 Spikelets glabrous, rarely the whole spikelet shortly and softly villous, or valves minutely pubescent 168
168. Awns longer than the valves 169
 Awns shorter than the valves, or valves mucronate 170
169. Valve passing directly into the awn 116. *Vulpia*, *Gmel.*
 Valve 2-lobed at the apex, with the awn from the back of the valve . . . 118. *Bromus*, *Linn.*
170. Ovary glabrous; styles inserted on top of the ovary 115. *Festuca*, *Linn.*
 Ovary villous on top; styles inserted on one side of the ovary 118. *Bromus*, *Linn.*
171. Spikelets 2-nate 172
 Spikelets solitary 173
172. Spikelets both alike, unequally peduncled 3. *Mescanthidium*, *Stapf.*
 Spikelets different; one sessile, the other peduncled 12. *Sorghum*, *Pers.*
173. Ligule ciliated or a fringe of hairs 174
 Ligule membranous or scarious 180
174. Leaf-sheath tubercled 175
 Leaf-sheath not tubercled 177

175. Lower glume very minute ; upper glume not scabrid 176
Both glumes well-developed, scabrid, at least the lower 27. *Arundinella*, Raddi.
176. Spikelets densely villous 40. *Tricholæna*, Schrad.
Spikelets not densely villous 28. *Melinis*, Beauv.
177. Valve 1 in each spikelet 54. *Aristida*, Linn.
Valves 2 in each spikelet 178
178. Valve subtending the fertile flower crustaceous, of a different texture to the lower valve 40. *Tricholæna*, Schrad.
Both valves of more or less the same texture 179
179. Spikelets scabrid 27. *Arundinella*, Raddi.
Spikelets not scabrid 72. *Trichopteryx*, Nees
180. Valve 1 in each spikelet 181
Valves 2 or 3 in each spikelet 185
181. Valve with long fine hair from the base ; hairs several times longer than the valve 61. *Calamagrostis*, Roth.
Valve if hairy, not with long fine hairs from the base 182
182. Valve exserted from the glumes 57. *Pseudobromus*, K. Schum.
Valve as long or shorter than the glumes 183
183. Awn about as long as or shorter than the spikelet 60. *Agrostis*, Linn.
Awn 2-3 times the length of the spikelet 184
184. Awn jointed to the valve and easily deciduous 56. *Oryzopsis*, Michx.
Awn persistent 55. *Stipa*, Linn.
185. Leaf-sheath tubercled 13. *Cleistachne*, Benth.
Leaf-sheath not tubercled 186
186. Valves 3 ; the uppermost subtending a bisexual flower 53. *Anthoxanthum*, Linn.
Valves 2, very rarely 3, but if so then the uppermost empty or subtending a male flower 187
187. Valves 2, very unequal 63. *Holcus*, Linn.
Valves 2, rarely 3, when 2 then not very unequal 188
188. Glumes almost hyaline, without a prominent keel 65. *Aira*, Linn.
Glumes membranous, with a distinct keel 67. *Deschampsia*, Beauv.
189. Inflorescence digitate, or sub-digitate, or of spikes, or spike-like racemes, or panicles, arranged on a central axis 190
Inflorescence an evident panicle or raceme, if a number of racemes from a central axis then the racemes more or less lax and not spike-like 220
190. Inflorescence digitate or sub-digitate 191
Inflorescence of spikes, or spike-like racemes, or panicles, arranged on a central axis 198
191. Spikelets 2-nate 192
Spikelets solitary 194
192. Nerves of lower glume tubercled 5. *Ischæmum*, Linn.
Nerves of lower glume not tubercled 193
193. Inflorescence subtended by a spathe 11. *Andropogon*, Linn.
Inflorescence not subtended by a spathe 37. *Digitaria*, Hall.
194. Ligule not ciliated, lower glume minute or suppressed 195
Ligule ciliated, lower glume evident 196
195. Visible nerves of spikelet parallel 37. *Digitaria*, Hall.
Visible nerves of spikelet curved 29. *Paspalum*, Linn.
196. Glumes, or at least the lower, as long as the valves 79. *Spartinia*, Schreb.
Valves exserted from the glumes 197
197. Flower 1 ; spikelet very rarely with a second reduced barren valve 78. *Cynodon*, Pers.
Flowers 3-6 88. *Eleusine*, Gaertn.
198. Valve subtending the fertile flower crustaceous, rounded at the apex, very abruptly produced into a short mucro 199
Valve subtending the fertile flower, if crustaceous sometimes very acute and shortly acuminate but not abruptly produced into a short mucro 200
199. Lower glume reduced to an annular swelling at the base of the spikelet 31. *Eriochloa*, H.B. & K.
Lower glume much smaller or sub-equaling the upper, but not reduced to an annular swelling 33. *Urechloa*, Beauv.

200. Glumes with bulbous-based hairs 201
 Spikelets glabrous or hairy but not with bulbous-based hairs 202
201. Glumes unequal and dissimilar; lower valve similar to the upper glume 34. *Bracharia*, *Gris*.
 Glumes equal and similar; lower valve unlike the upper glume 107. *Lasiochloa*, *Kunth*
202. Rachilla evident at the base of the spikelet as a very short stalk which articulates with the peduncle 38. *Leucophrys*, *Rendle*
 Rachilla not evident at the base of the spikelet as a short stalk 203
203. Spikelets 2-nate, or clustered, very rarely 3-nate 204
 Spikelets solitary 208
204. One spikelet sessile, the other peduncled; ligule ciliate; whole inflorescence densely rufous-villous 2. *Eriochrysis*, *Beauv*.
 All spikelets peduncled; peduncles often very unequal, or spikelets sub-sessile and more or less clustered; ligule not ciliate, rarely ciliate but if so then 1 valve crustaceous 205
205. Spikelets sub-sessile, clustered, crowded on the rhachis 35. *Echinochloa*, *Beauv*.
 Spikelets peduncled, rarely 1 sub-sessile, 2-nate, very rarely 3-nate 206
206. Visible nerves of spikelets (lower valve) curved 207
 Visible nerves of spikelets (lower valve) parallel 37. *Digitaria*, *Hall*.
207. Glumes sub-equal 34. *Bracharia*, *Gris*.
 Lower glume much smaller than the upper, or obsolete 29. *Paspalum*, *Linn*.
208. Ligule not ciliate 209
 Ligule ciliate, sometimes almost obsolete 214
209. Valve and pale rigidly ciliate; glumes 0 50. *Leersia*, *Sw*.
 Glumes eiliate with soft white hairs or not ciliate 210
210. Glumes as long as the valves 211
 Valves exerted from the glumes 212
211. Valves ciliate with long white hairs 91. *Crossotropsis*, *Stapf*
 Valves not ciliate with long white hairs 52. *Phalaris*, *Linn*.
212. Both glumes or one glume about $\frac{1}{2}$ the length of the spikelet 113. *Poa*, *Linn*.
 Spikelet at least 3-9 times as long as the glumes 213
213. Glumes at least 9 times as short as the spikelet 117. *Scleropoa*, *Griseb*.
 Glumes at least 3 times as short as the spikelet 99. *Diplachne*, *Beauv*.
214. Spikelets glabrous 215
 Spikelets hairy 218
215. Valve subtending the fertile flower crustaceous 34. *Bracharia*, *Gris*.
 Valve subtending the fertile flower not crustaceous 216
216. Spikelet 1-flowered 58. *Sporobolus*, *R.Br*.
 Spikelet more than 1-flowered 217
217. Rhachis evidently flattened 85. *Tetrachne*, *Nees*
 Rhachis not or scarcely flattened 100. *Pogonarthria*, *Stapf*
218. Valves membranous 99. *Diplachne*, *Beauv*.
 Upper valve crustaceous 219
219. Crustaceous valve smooth and polished 35. *Echinochloa*, *Beauv*.
 Crustaceous valve minutely rugose 34. *Bracharia*, *Gris*.
220. Keel of glumes tubercled, or valves conspicuously transversely rugose, or tubercled, or regularly and minutely punctate 221
 Keel of glumes not tubercled nor valves rugose nor punctiform 223
221. Keel of glumes tubercled 75. *Pentastichis*, *Stapf*
 Keel of glume not tubercled 222
222. Valves conspicuously transversely rugose or tubercled 51. *Ehrharta*, *Thunb*.
 Valves minutely punctate; spikelet flattened 49. *Oryza*, *Linn*.
223. Spikelets (valve and pale) rigidly ciliate 50. *Leersia*, *Sw*.
 Spikelets not rigidly eiliate 224
224. Spikelets 2-nate, one peduncled, the other sessile 12. *Sorghum*, *Pers*.
 Spikelets solitary, very rarely 2-nate, but if so then both peduncled 225
225. Spikelets very oblique at the base; the upper glume almost gibbous 36. *Sacciolepis*, *Nash*
 Spikelet not gibbous at the base 226

226. Ligule not ciliate, rarely fimbriate; one or both glumes always evident 227
 Ligule ciliate, or reduced to a mere rim; if minutely ciliate then both glumes reduced to minute linear scales 243
227. Spikelet hairy 228
 Spikelet glabrous or very minutely pubescent 232
228. Glumes standing more or less at right angles to the valves and peduncle; valves more or less papery; peduncle capillary 106. *Briza*, Linn.
 Glumes more or less erect; valves not papery 229
229. Uppermost valves embracing each other and forming a distinct club-shaped or ellipsoid body 104. *Melica*, Linn.
 Uppermost valves not forming a club-shaped or ellipsoid body 230
230. Spikelet 1-flowered 61. *Calamagrostis*, Roth.
 Spikelet more than 1-flowered 231
231. Fertile flower 1; valves dissimilar 51. *Ehrharta*, Thunb.
 Fertile flowers more than 1; valves similar 113. *Poa*, Linn.
232. Valve and pale enclosing the bisexual flower crustaceous 32. *Panicum*, Linn.
 Valve and pale enclosing the bisexual flower not crustaceous 233
233. Glumes as long as or almost as long as the valves 234
 Glumes evidently shorter than the valves 236
234. Inflorescence a much contracted dense elongated panicle 52. *Phalaris*, Linn.
 Inflorescence a lax open panicle or raceme, or leaves represented by sheaths only 235
235. Spikelet 1-flowered; valve 1 60. *Agrostis*, Linn.
 Spikelet with 1-fertile flower; valves 3 51. *Ehrharta*, Thunb.
236. Spikelets more or less nodding on capillary peduncles, almost truncate at the base; valves more or less papery 106. *Briza*, Linn.
 Spikelets more or less tapering to the base; valves not papery 237
237. Fertile flower 1 51. *Ehrharta*, Thunb.
 Fertile flowers 2 or more 238
238. Spikelet 1 cm. or more long 239
 Spikelet less than 1 cm. long 241
239. Spikelet linear; glumes about 3 times as short as the spikelet 99. *Diplachne*, Beauv.
 Spikelet more or less oblong or elliptic; glumes about $\frac{1}{2}$ as long as the spikelet 240
240. Valves distinctly several-veined; ovary villous; styles inserted below the top of the ovary (lateral). 118. *Bromus*, Linn.
 Valves very rarely distinctly veined; ovary glabrous, pubescent, or shortly pilose; styles inserted on top of the ovary 115. *Festuca*, Linn.
241. Glumes and valves keeled; valves usually pilose, sometimes with a tuft of long woolly hairs at the base 113. *Poa*, Linn.
 Glumes and valves rounded on the back; valves glabrous or minutely pubescent 242
242. Primary branches of inflorescence solitary on the central axis, branched almost from the base, angled 117. *Scleropoa*, Griseb.
 Primary branches fascicled on the central axis, (some) branched only $\frac{1}{2}$ way up, semi-terete 114. *Atropis*, Griseb.
243. Spikelets hairy 244
 Spikelets glabrous or almost so 250
244. Spikelet with a single valve 67. *Poa*, Griseb.
 Spikelet with 2-8 valves 245
245. Valves more than 3 246
 Valves 2-3 247
246. Lower glume 1-nerved 99. *Diplachne*, Beauv.
 Lower glume 5-7-nerved 112. *Schismus*, Beauv.
247. Spikelet with 3 valves 51. *Ehrharta*, Thunb.
 Spikelet with 2 valves 248

248. Lower glume evident **38. Leucophrys**, Rendle
 Lower glume reduced to a small scale, or obsolete 249
249. Upper glume and lower valve gibbous at or below the middle ;
 glumes almost hidden by long hairs **40. Tricholæna**, Schrad.
 Upper glume and lower valve not gibbous, glabrous or hairy but
 spikelet not hidden by long hairs **41. Xyochlæna**, Stapf
250. Spikelet much compressed, ovate in outline, about 5 mm. broad
105. Demazeria, Dumort
 Spikelet not ovate in outline, much less than 5 mm. broad, if
 almost 5 mm. broad then the glumes not half the length of the
 spikelet 251
251. Lower valve crustaceous 252
 Valves membranous, rarely chartaceous but then spikelet with 2
 or more valves 255
252. Glumes and valves with flattened tips **39. Acroceras**, Stapf
 Glumes and valves not with flattened tips 253
253. Lower glume much reduced and forming an annular swelling at
 the base of the spikelet **31. Eriochloa**, H.B. & K.
 Lower glume sometimes reduced, but not forming an annular
 swelling at the base of the spikelet 254
254. Lower glume reduced to a minute scale ; tip of upper glume and
 lower valve minutely notched or bilobed **41. Xyochlæna**, Stapf
 Lower glume well developed ; tip of upper glume and lower valve
 entire, very rarely 3-5-fid. **32. Panicum**, Linn.
255. Valves with prominently raised, almost winged, ribs ; both glumes
 almost obsolete **48. Potamophila**, R.Br.
 Valves not with prominently raised ribs 256
256. Lower glume reduced to a hyaline villous scale, or obsolete ; valves 2
41. Xyochlæna, Stapf
 Both glumes developed ; if the lower reduced or both very small
 then the valve solitary 257
257. Spikelet with a single valve 258
 Spikelet with 2 to many valves 259
258. Glumes equal or sub-equal ; valve shorter than the glumes
66. Poagrostis, Stapf
 Lower glume often shorter than the upper ; valve never or scarcely
 shorter than the glumes **58. Sporobolus**, R.Br.
259. Spikelet with 2 valves 260
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260. Valves exceeding the glumes **102. Eragrostis**, Beauv.
 Valves equalling or shorter than the glumes **75. Pentaschistis**, Stapf
261. Lower glume 1-nerved 262
 Lower glume 5-7-nerved **112. Schismus**, Beauv.
262. Ligule a fringe of short hairs, very rarely membranous
102. Eragrostis, Beauv.
 Ligule reduced to a rim, sometimes very minutely ciliated
99. Diplachne, Beauv.

Spikelets all alike, generally 2-nate and unequally peduncled, disarticulating from the peduncles. *Flower* usually solitary, sometimes a lower male flower present. *Glumes* sub-equal, membranous, 3-9-nerved, rarely nerveless, enveloped by very long silky hairs from their bases and from the obscure callus. *Valves* 2, generally much smaller than the glumes, hyaline, awnless ; upper smaller than the lower, subtending the bisexual flower ; lower empty, rarely subtending a male flower. *Pale* hyaline, broad, nerveless. *Lodicules* 0. *Stamens* 1-2. *Styles* connate below ; stigmas linear, exerted from the top of the spikelet. *Grain* oblong in outline ; embryo $\frac{1}{2}$ the length of the grain or more.

Perennials; basal leaves crowded and, like those of the innovation shoots, long; inflorescence a spike-like or narrowly thyrsiform silvery-silky panicle, with the branches continuous and bearing the peduncled spikelets.

Species 5-6, in the warm regions of both hemispheres, 2 species in South Africa found in the coastal districts from Clanwilliam to Natal; also in the Transvaal, Bechuanaland, and S.W. Africa.

111

2. ERIOCHRYSIS, Beauv.

(*Saccharum*, Linn.)

Spikelets 2-nate, one peduncled, the other sessile, surrounded by short or moderately long hairs springing from the callus. *Sessile spikelet* deciduous with the adjoining internode of the rhachis and the peduncle. *Flower* 1. *Glumes* more or less unequal; lower chartaceous or coriaceous, with narrow inflexed margins, with 3 to several intercarinal nerves and usually a few oblique transverse veins; upper thinner, 1-3-nerved. *Valves* 2, hyaline, muticous, nerveless; upper subtending the flower and smaller than the barren lower. *Pales* 0. *Lodicules* 2, cuneate. *Stamens* 3. *Stigmas* laterally exerted. *Grain* obovoid to globose; embryo $\frac{1}{2}$ the length of the grain. *Peduncled spikelet* similar to the sessile, but the flower female with rudimentary stamens, falling entire from its peduncle.

Perennials; leaves mostly crowded at the base; ligule membranous, usually ciliate; inflorescence a contracted fulvously or rufously hairy panicle; branches spike-like, with a readily disarticulating rhachis.

Species 5, natives of Africa and America; 2 species in South Africa, recorded from the Transvaal and Natal.

112

3. MISCANTHIDIUM, Stapf

(*Erianthus*, Michx.)

Spikelets all alike, 2-nate, unequally peduncled, very rarely one sessile, usually villous and with an involucre of hairs at the base, falling entire from the peduncles. *Flower* 1. *Glumes* equal, chartaceous to coriaceous; lower dorsally flattened, more or less distinctly 2-keeled, with inflexed margins and a variable number of intracarinal nerves; upper 1-3-nerved, keeled. *Valves* 2, hyaline; lower empty, muticous or mucronate; upper subtending the flower, awned. *Pale* small, hyaline, nerveless. *Lodicules* 2, cuneate. *Stamens* 3. *Stigmas* usually laterally exerted. *Grain* oblong to linear-oblong in outline; embryo $\frac{1}{2}$ the length of the grain.

Erect perennials; leaf-blade terete, or long and narrow, with a very stout midrib; ligule membranous; inflorescence a much branched panicle, often large, silky; branches with a tough or very tardily or readily disarticulating rhachis.

An African genus of 4 species; 3 species in South Africa, found in the Transvaal, Natal, the O.F.S. and the south-western and central districts.

113

4. POLLINIA, Trin.

Spikelets alike or nearly so, 2-nate, one peduncled, the other sessile, hairy or glabrous. *Flowers* 1-2; when 2 then the lower male and the upper bisexual. *Glumes* equal; lower membranous, muticous, often truncate, dorsally flattened, or concave, or longitudinally grooved, more or less 2-keeled, with inflexed margins; upper often narrower, keeled, acute, sometimes with a fine straight micro. *Valves* usually 2; lower hyaline, muticous, sometimes reduced or quite suppressed, barren or subtending a male flower; upper hyaline, 2-lobed, with a fine or rather stout or more or less kneed

awn from the sinus, subtending a bisexual flower. *Pale* small, hyaline, or 0. *Stamens* 3. *Styles* distinct; stigmas plumose. *Grain* oblong in outline; hilum punctiform; embryo rather large.

Annuals or perennials; leaf-blade often narrow, sometimes conspicuously contracted at the base; ligule membranous; inflorescence a terminal panicle; branches spike-like, simple, fascicled, or digitately arranged, with a readily disarticulating rhachis.

Species about 25, natives of the tropical and sub-tropical regions of the Old World; 2 species in South Africa, found in the Transvaal, Natal, and the coastal districts of the Cape Province.

119

5. ISCHÆMUM, Linn.

Spikelets 2-nate, both alike, or differing only in sex, or more or less heteromorphous, one peduncled, the other sessile. *Sessile spikelets* dorsally compressed, often rather broad, deciduous with the adjacent internode of the rhachis and the peduncle. *Flowers* 1-2, when 2 then the lower male and the upper usually bisexual. *Glumes* equal or sub-equal; lower dorsally flattened or somewhat convex, usually coriaceous below, chartaceous and markedly nerved upwards, rarely concave and more or less chartaceous throughout, more or less 2-keeled, with inflexed margins; upper boat-shaped, keeled at least above, sometimes awned. *Valves* 2, rigidly membranous to hyaline; lower muticous, empty or subtending a male flower; upper usually 2-fid and awned from the sinus, rarely mucronate or muticous, subtending a bisexual flower. *Pales* more or less equalling their valves, hyaline. *Lodicules* 2, cuneate. *Stamens* 3, sometimes smaller or rudimentary in the fertile flower. *Stigmas* linear-oblong, laterally exerted. *Grain* oblong or lanceolate in outline, dorsally compressed; embryo reaching to the middle of the grain. *Peduncled spikelet* either like the sessile in sex and form, or male, or more or less reduced, sometimes apparently laterally compressed with a median keel owing to the more or less complete suppression of one side, falling entire from its peduncle.

Generally perennials; leaf-blade convolute when young, becoming flat with age; ligule generally membranous; inflorescence of compressed 2-nate digitate or fascicled racemes; rhachis readily disarticulating; internodes flattened or sub-concave on the inner side, often stout.

Species about 50, natives of South America and the tropics of the Old World; 4 species in South Africa, found in the Transvaal and Natal.

119a

6. SEHIMA, Forsk.

Spikelets 2-nate, one sessile, the other peduncled, those of each pair differing in sex and (in the African species) also much in shape. *Sessile spikelets* deciduous together with the adjacent internode of the rhachis and the peduncle. *Flowers* 2; lower male; upper bisexual. *Glumes* equal or sub-equal; lower deeply grooved, rarely flat, 2-toothed or 2-mucronate, more or less chartaceous, acutely 2-keeled upwards, with inflexed margins, with the keels winged; upper boat-shaped, keeled upwards, with a bristle-like awn. *Valves* 2, hyaline; lower entire, muticous, subtending a male flower; upper 2-fid, awned from the sinus, subtending a bisexual flower. *Pales* more or less equalling their valves, hyaline. *Lodicules* 2, cuneate. *Stamens* 3. *Stigmas* linear-oblong, laterally exerted. *Grain* oblong in outline, obtusely 3-angled; embryo reaching to the middle of the grain. *Peduncled spikelets* flat, with (in the African species) a strongly nerved or ribbed lower glume, tardily separating from its peduncle; peduncle sub-linear and parallel with the internode of the rhachis. *Valves* 2; the upper sometimes subtending a male flower; the lower without a flower.

Perennials or annuals; leaf-blade convolute when young, at length flat, narrow; ligule a line of stiff hairs; inflorescence a spike-like raceme, usually gently curved, dorsi-ventrally and laterally compressed, with the peduncled spikelets converging over the convex side; rhachis readily disarticulating; internodes sub-linear.

Species about 6, natives of Africa, India, and North America; 1 species recorded from the Transvaal.

125

7. URELYTRUM, Hack.

Spikelets 2-nate, one sessile, the other peduncled, those of each pair differing in shape and sex. *Sessile spikelet* deciduous with the adjacent internode of the rhachis and the peduncle. *Flowers* 2; lower male; upper bisexual. *Glumes* equal or sub-equal; lower coriaceous, dorsally flattened, 2-keeled, muticous; upper sub-chartaceous or membranous, boat-shaped, keeled. *Valves* 2, hyaline, sub-equal, slightly shorter than the glumes, muticous; lower 2-nerved, subtending a male flower; upper 3 to sub-5-nerved, subtending a bisexual flower. *Pales* hyaline, almost equalling their valves, 2-nerved. *Lodicules* 2, cuneate. *Stamens* 3. *Stigmas* linear, laterally exserted. *Grain* narrow-oblong in outline, terete at the middle; scutellum reaching to the middle; hilum basal, obovate. *Peduncled spikelet* with the lower glume narrowed into a subulate often very long awn, otherwise as in the sessile spikelet, or more or less reduced sometimes to a pair of rudimentary glumes, the lower of which is represented by a long awn flattened and widened at the base. *Valves* 2, both subtending male flowers, or both valves absent.

Perennials, rarely annuals; culm erect, few-noded, simple; leaf-blade narrow, linear, flat or convolute; inflorescence of solitary paired or paniced sub-cylindric spike-like racemes; rhachis readily disarticulating; internodes obliquely truncate and appendaged at the tips.

An African genus of 6-7 species; 1 species recorded from the Transvaal and Natal.

127a

8. HEMARTHRIA, R.Br.

(under *Rottboellia*, Linn. f.)

Spikelets 2-nate, one sessile, the other peduncled but appearing sessile owing to the peduncle being fused with the adjacent internode of the rhachis, alike in sex and more or less in shape. *Sessile spikelets* sunk in concave hollows on the inner face of the rhachis. *Flower* 1. *Glumes* equal or sub-equal; lower coriaceous or sub-coriaceous, flat on the back, 2-keeled, very narrowly inflexed along the margins; upper membranous, more or less boat-shaped, tightly appressed to the sides of the cavity. *Valves* 2, hyaline; lower 2-nerved, without a flower; upper subtending the flower, usually nerveless. *Pales* hyaline, nerveless, or more or less reduced, or 0. *Lodicules* 2, cuneate. *Stamens* 3. *Stigmas* laterally exserted. *Grain* oblong in outline, slightly compressed dorsally; hilum conspicuously sub-basal, punctiform; embryo about $\frac{2}{3}$ the length of the grain. *Peduncled spikelet*, particularly the terminal, with the glumes more acuminate than those of the sessile spikelet; the lower often with a very long narrow rigid acumen.

Decumbent or ascending perennials; culm branched, many-noded; leaf-blade linear, conduplicate in bud, ultimately becoming flat; ligule very short, membranous, sometimes ciliate; inflorescence of spike-like compressed often curved racemes; racemes terminating the culm and its often fascicled branches, each supported by a spathe, more or less subulate at the tips owing to the slender terminal spikelet; rhachis tough or tardily disarticulating; internodes truncate at the tips, hollowed out on the inner face.

Species about 8, natives of the warmer regions of the Old World ; 1 species in South Africa, extending from the Transvaal and Natal to the coastal and central districts of the Cape Province.

131

9. TRACHYPOGON, Nees

Spikelets 2-nate, unequally peduncled, those of each pair differing in sex and slightly in shape, sometimes solitary and peduncled at the base of the inflorescence ; peduncles fused towards the base with each other and the adjacent internode of the rachis, terete or sub-terete ; longer peduncle disarticulating very obliquely ; shorter peduncle sometimes so short that spikelet is sub-sessile. *Long-peduncled spikelet* more or less terete, awned, falling separately ; callus acute to very pungent, densely bearded. *Flower* 1. *Glumes* equal or sub-equal ; lower firmly chartaceous to coriaceous, sub-convolute, firmly 2-keeled upwards, with very narrow inflexed margins or the margins reduced to a mere rim ; nerves 5-9 in addition to the keel nerves, mostly obscure except in transmitted light, more or less connected by transverse veins in the upper part ; upper glume thinner in texture than the lower, 3-nerved, grooved on either side of the rounded keel. *Valves* 2 ; lower hyaline, 2-nerved, ciliate or ciliate upwards, without a flower or pale ; upper stipitiform, hyaline at the base, cartilaginous upwards, 3-nerved at the base, passing into a flexuous or kneed awn, subtending the flower. *Pale* very small, hyaline, or 0. *Lodicules* 2, glabrous. *Stamens* 3. *Styles* terminal ; stigmas laterally exserted. *Grain* terete ; embryo about $\frac{1}{2}$ the length of the grain. *Sub-sessile spikelet* persistent, dorsally flattened, particularly those on the lower portion of a raceme, or more or less terete, awnless ; callus 0. *Flower* 1, male or neuter. *Glumes* similar to those of the long-pedicelled spikelet. *Valves* 2 ; lower similar to that of the long-peduncled spikelet, without a flower or pale ; upper narrow, hyaline, entire or 2-toothed, with or without a minute mucro, rarely produced into a short bristle sometimes subtending a male flower. *Stamens* 3. *Pistil*, if present, rudimentary.

Densely caespitose perennials, very rarely annuals ? ; culm more or less slender, wiry, conspicuously bearded below the nodes ; beards appressed, covering the constricted nodes ; leaf-blade narrow, frequently convolute ; inflorescence a solitary raceme, or of 2-nate or digitate racemes terminating the culms ; rachis tough or very tardily disarticulating upwards, many-noded ; internodes marked off by very oblique and usually shortly bearded articulation lines.

Species 9 or 10, natives of Africa, Madagascar and the northern parts of America ; 1 species in South Africa extending from the Transvaal, Natal, O.F.S., through the coastal districts to the Riversdale district.

132

10. ELIONURUS, Humb. and Bonpl.

Spikelets 2-nate, one sessile, the other peduncled, usually similar in form, differing in sex, usually awnless. *Sessile spikelet* deciduous with the adjacent internode of the rachis and the accompanying peduncle. *Flower* 1. *Glumes* equal, differing in form ; lower sub-coriaceous to herbaceous, often 2-toothed or 2-fid, rarely awned, dorsally flattened, 2-keeled, usually with filiform transparent oil ducts close to the ciliate or penicillate keels ; upper membranous, lanceolate, acute, rarely awned. *Valves* 2, hyaline, awnless ; lower without a flower. *Pales* rudimentary or 0. *Lodicules* 2, cuneate. *Stamens* 3. *Stigmas* laterally exserted. *Grain* oblong in outline, dorsally compressed ; embryo about $\frac{1}{2}$ the length of the grain. *Peduncled spikelet* male or barren.

Generally caespitose aromatic perennials ; leaf-blade flat or folded ; ligule membranous, very short, sometimes ciliate ; inflorescence a solitary spike-like

raceme ; internodes of rhachis compressed, usually villous, with oblique not appendaged tips, disarticulating below the spikelets.

Species about 15, natives of the tropical and sub-tropical regions of both hemispheres ; 1 species in South Africa, fairly widely distributed.

134

11. ANDROPOGON, Linn.

Spikelets 2-nate, one sessile, the other peduncled, those of each pair differing in sex and mostly also more or less in shape and size, or those of the lowest pair of the lowest raceme homogamous (male or imperfect). *Sessile spikelet* dorsally or laterally compressed, nearly always awned, falling with the adjacent internode of the rhachis and the accompanying peduncle ; callus short, mostly quite obtuse, shortly bearded. *Flower* 1, bisexual in those of the heterogamous pairs ; in those of the homogamous pairs male or suppressed. *Glumes* equal or sub-equal, sub-coriaceous to membranous ; lower flat, or concave, or channelled on the back, with sharply inflexed margins at least from the middle upwards, 2-keeled ; upper more or less boat-shaped, keeled upwards, 3-1-nerved, sometimes awned. *Valves* 2, usually ciliate or ciliolate ; lower hyaline, 2-nerved, without a flower or pale ; upper hyaline or membranous, 2-fid or 2-toothed, awned, very rarely awnless, sometimes sub-stipitiform below the insertion of the awn. *Pale* a hyaline nerveless scale, or 0. *Lodicules* 2, glabrous. *Stamens* 3. *Styles* terminal ; stigmas laterally exserted. *Grain* narrowly lanceolate to oblong in outline, sub-terete to plano-convex ; embryo about $\frac{1}{2}$ the length of the grain. *Peduncled spikelet* always more or less compressed dorsally, never concave nor channelled on the back, sometimes reduced and then often small or quite suppressed ; peduncle filiform, linear, linear-oblong, or spatulate. *Glumes* herbaceous-chartaceous to membranous, sometimes one or both shortly awned. *Valves* 2, hyaline, ciliate, mucous ; the lower without a flower ; upper empty, or sometimes subtending a male, more rarely a bisexual flower.

Mostly perennials of varying habit ; culm simple or branched ; ligule membranous-scarious, sometimes ciliate ; inflorescence of paired digitate or sub-digitate racemes, rarely of a solitary raceme ; racemes supported by a spathe or spatheole, frequently collected into a false panicle ; rhachis many-noded, readily disarticulating at the nodes ; internodes usually similar in shape to the peduncles, often more or less cupular or auricled at the tips.

Species very numerous, mostly tropical ; 7-8 species in South Africa widely distributed.

134a

12. SORGHUM, Pers.

(under *Andropogon*, Linn.)

Spikelets 2-nate, one sessile, the other peduncled or represented by a peduncle only ; those of each pair differing in sex and shape. *Sessile spikelet* dorsally compressed, falling with the adjacent internode of the rhachis and the accompanying peduncled spikelet or at least its peduncle. *Flower* 1. *Glumes* equal, coriaceous (at least when mature), rarely permanently chartaceous, mucous ; lower with a broad flattened or convex back, with the margins narrowly inflexed near the tips and otherwise involute ; upper boat-shaped, keeled upwards, with narrow hyaline margins, ciliolate above, sometimes mucronate. *Valves* 2, hyaline, ciliate ; lower 2-nerved or nerveless, without a flower or pale ; upper oblong to ovate, 2-toothed or 2-lobed, with a perfect or variously reduced awn or mucro arising from the sinus, rarely entire and mucronate or mucous, 1-2-nerved, subtending the bisexual flower. *Lodicules* 2, ciliate or glabrous. *Pale* hyaline, often minute, or 0. *Stamens* 3. *Styles* terminal or sub-terminal ; stigmas laterally exserted. *Grain* in the

spontaneous species mostly obovoid, dorsally compressed, in the cultivated forms globose or sub-globose; embryo as long as or slightly longer than half the grain. *Peduncled spikelet*, if present, much narrower than the sessile, lanceolate to subulate, sometimes variously reduced or quite suppressed. *Glumes* awnless. *Valves* 2, hyaline, 2-1-nerved, ciliate, awnless; the lower without a flower or pale; the upper sometimes subtending a male flower.

Annuals or perennials, often robust; leaf-blade convolute in bud, usually flat, herbaceous, often large; ligule membranous; inflorescence an erect or nodding often large panicle; panicle mostly loose in the spontaneous species, frequently variously contracted to compact in the cultivated forms; primary branches verticillate or scattered on the central rhachis; rhachis readily disarticulating or (in cultivated forms) tough, with few to many nodes.

Species many; natives of the tropics and sub-tropics, rare in temperate regions; 3-4 species in South Africa; extending from the Transvaal through the coastal districts to Namaqualand.

134b

13. CLEISTACHNE, Benth.

Spikelets solitary, peduncled, falling entire from the thickened tips of the peduncles. *Flower* 1. *Glumes* equal, very similar, more or less coriaceous, muticous, with involute margins, delicately 7-9-nerved. *Valves* 2, hyaline; lower 2-nerved, without a flower or pale; upper 2-toothed or sub-entire, 3-nerved, with a twisted flexuous awn from the sinus or tip, subtending the bisexual flower. *Pale* very minute, ciliate. *Lodicules* 2, broad-cuneate, sparingly ciliate. *Stamens* 3. *Stigmas* laterally exerted, plumose. *Grain* oblong or obovate-oblong in outline, very obtuse to truncate; embryo $\frac{1}{2}$ the length of the grain.

Rather coarse annuals; leaf-blade long, flat, with stout midribs; ligule scarious; inflorescence a narrow more or less contracted greyish or fulvously hairy panicle; rhachis tough.

Species 3, natives of tropical Africa and western India; 1 species recorded from the northern Transvaal.

134c

14. CHRYSOPOGON, Trin.

(under *Andropogon*, Linn.)

Spikelets 3-nate, 1 sessile and 2 peduncled, the trio falling entire, rarely 2-nate (one sessile and the other peduncled) and both falling with the adjacent internode of the rhachis. *Sessile spikelet* usually laterally compressed, awned. *Flower* 1. *Glumes* sub-equal; lower coriaceous or chartaceous, involute, with a rounded back, or complicate and more or less keeled upwards; upper boat-shaped, more or less keeled, sometimes awned. *Valves* 2, hyaline; lower 2-nerved, without a flower or pale; upper linear, entire, 2-toothed or 2-lobed, with a usually perfect awn from the sinus, subtending the bisexual flower. *Pale* 0, or small, hyaline, nerveless. *Lodicules* 2, glabrous. *Stamens* 3. *Stigmas* laterally exerted low down. *Grain* linear in outline, laterally compressed; embryo half the length of the grain. *Peduncled spikelet* dorsally compressed, awned or awnless; peduncle linear-filiform, never longitudinally grooved nor appendaged. *Valves* 2; lower without a flower or pale; upper sometimes subtending a male flower.

Mostly perennials (all the Old World species); leaf-blade narrow; ligule membranous, sometimes ciliate; inflorescence usually a lax panicle consisting of whorled, rarely solitary or binate branches from the central axis; primary branches simple or branched near the base, bearing at their tips a trio of spikelets, oblique and nearly always bearded below the spikelets, rarely with one

or more pairs of spikelets lower down ; internodes of rhachis (where any) linear-filiform, never longitudinally grooved nor appendaged.

Species about 18, mostly in the warm parts of the Old World ; 1 species in South Africa, recorded from the Transvaal and Bechuanaland.

134d

15. AMPHILOPHIS, Nash

Spikelets 2-nate, one sessile, the other peduncled, similar in shape or the peduncled reduced and smaller, differing in sex except sometimes in the lowermost pair which may be homogamous (male or neuter). *Sessile spikelet* (of heterogamous pairs) dorsally compressed, awned, deciduous together with the adjacent internode of the rhachis and the peduncle ; callus small, shortly bearded. *Flower* 1. *Glumes* equal, thinly chartaceous to membranous ; lower 2-keeled, often with a circular depression in the middle, with narrow sharply inflexed margins ; upper boat-shaped, 3-nerved, acutely keeled. *Valves* 2 ; lower hyaline, nerveless, without a flower or pale ; upper reduced to a hyaline linear stipe, firmer upwards, passing into a slender awn, subtending the bisexual flower. *Pale* 0, or very minute. *Lodicules* 2, glabrous. *Stamens* 3. *Stigmas* exerted laterally, usually low down, longer than the styles. *Grain* oblong in outline, obtuse, dorsally slightly compressed ; embryo about $\frac{1}{2}$ the length of the grain. *Peduncled spikelet* awnless, (always ?) deciduous ; peduncle narrow-linear, longitudinally grooved and hyaline in the groove, disarticulating horizontally. *Valves* 2 or 1, (if present) hyaline, nerveless, never subtending a perfect flower.

Perennials ; culm slender, simple or branched, bearded or beardless at the nodes ; leaf-blade various, usually narrow-linear and more or less flat ; ligule membranous, sometimes ciliate ; inflorescence usually of shortly peduncled racemes arranged digitately or sub-digitately, or on a more or less elongated axis ; rhachis many-noded, easily disarticulating horizontally ; internodes narrow-linear, longitudinally grooved and hyaline in the groove.

Species about 25, mostly natives of tropical Asia ; 4 species in South Africa, extending from the Transvaal and Natal to Knysna ; also recorded from Namaqualand and a few central districts.

134e

16. DICHANTHIUM, Willemet.

(under *Andropogon*, Linn.)

Similar in all respects with *Amphilophis* but differs in the peduncles and internodes of the rhachis being solid and without a hyaline groove.

Species 8, natives of the tropical and warm temperate regions of the Old World ; 2 species in South Africa, extending from the Transvaal into Griqualand West and some of the central districts ; also recorded from Namaqualand.

134f

17. SCHIZACHYRIUM, Nees

Spikelets 2-nate, one sessile, the other peduncled, differing in sex and more or less in shape and size. *Sessile spikelet* dorsally compressed or almost terete in the lower half, awned, deciduous with the adjacent internode of the rhachis and the accompanying peduncled spikelet ; callus short, shortly bearded at the very base. *Flower* 1. *Glumes* equal or sub-equal ; lower chartaceous (often thinly) to sub-coriaceous, more or less convex (to semi-terete) or flat on the back at least from the middle upwards, with sharply inflexed and mostly narrow margins, 2-keeled, with the keels running out into teeth or mucros ; upper thinner to membranous, narrowly boat-shaped to dorsally flattened, keeled (at least upwards), 1-3-nerved, with the delicate margins ciliolate. *Valves* 2, hyaline, ciliolate ; lower membranous downwards, often purplish, without a flower or pale ; upper usually

2-fid or 2-toothed, more rarely 2-partite or entire, with an awn continuous with or from the sinus of the lobes, subtending the bisexual flower. *Pale* 0, or represented by a microscopic hyaline scale. *Lodicules* 2, glabrous. *Stamens* 3, rarely 2. *Styles* terminal; stigmas laterally exerted low down. *Grain* narrowly linear in outline or tapering upwards, sub-terete; embryo short. *Peduncled spikelet* similar to the sessile, but usually relatively broader and flatter, or more or less reduced and then sometimes quite small, falling with the sessile spikelet; peduncles thickened upwards, often rather stout, with a scarious cupuliform and more or less toothed terminal appendage. *Glumes* more or less membranous; lower aristulate or muticous. *Valves* 2 or 0, if present, hyaline, ciliate, muticous; upper valve sometimes subtending a male flower.

Annuals or perennials, rarely suffrutescent, never very tall; culm slender; sometimes branched; leaf-blade folded in bud, usually narrow; ligule membranous or scarious; inflorescence a lax false panicle formed of a number of long cylindric spike-like racemes; racemes solitary and terminating the branches of the culm, supported by a spathe; rhachis many-noded, disarticulating; internodes thickened upwards, often rather stout with a scarious cupuliform and more or less toothed terminal appendage; spathes mostly very narrow, scarious, membranous or herbaceous below.

Species many, natives of tropical countries; 1 species in South Africa, recorded from the Transvaal, Bechuanaland, and Natal.

134g

18. CYMBOPOGON, Spreng.

(under *Andropogon*, Linn.)

Spikelets 2-nate, one sessile, the other peduncled, those of each pair usually differing in sex and more or less in shape; lowermost pair of spikelets of the lower or of both racemes homogamous (usually male). *Sessile spikelet* of heterogamous pair dorsally, rarely laterally, compressed, usually awned, falling with the adjacent internode of the rhachis and the accompanying peduncle; callus very short, obtuse, shortly bearded. *Flower* 1. *Glumes* equal or sub-equal, more or less chartaceous; lower almost flat, or slightly depressed, or narrowly grooved on the back, 2-keeled, with the margins sharply inflexed at least from the middle upwards; upper more or less boat-shaped, keeled upwards, usually 1-nerved. *Valves* 2, ciliate or ciliate (sometimes obscurely); lower entire, hyaline, 2-nerved, without a flower or pale; upper 2-fid or 2-lobed, hyaline, rarely firmer and almost stipe-like below the insertion of the awn, subtending the bisexual flower; column of awn, if any, smooth. *Pale* 0. *Lodicules* 2, minute, glabrous. *Stamens* 3. *Styles* terminal; stigmas laterally exerted. *Grain* oblong in outline, circular to plano-convex in cross-section; embryo about $\frac{1}{2}$ the length of the grain. *Peduncled spikelet* never depressed nor grooved on the back; peduncles filiform or linear, frequently with more or less cupular or auricled tips; those of lower racemes often conspicuously swollen, oblong or barrel-shaped, hard. *Glumes* muticous; lower chartaceous to sub-chartaceous; upper thinner. *Valves* 2; lower hyaline, 2-nerved, without a flower or pale; upper sometimes subtending a male flower.

Perennials, densely tufted, usually aromatic; culm simple or branched; leaf often very coarse; ligule membranous; inflorescence of terminal paired racemes supported by a spatheole; raceme-pairs often grouped in much-branched and contracted spatheate panicles; rhachis many-noded, disarticulating; internodes similar to the peduncles.

Species numerous in tropical and sub-tropical countries; 2 species in South Africa with a wide distribution.

134h

19. HYPARRHENIA, Anderss.

(under *Andropogon*, Linn.)

Spikelets 2-nate, one sessile, the other peduncled; those of each pair differing in sex and more or less in shape, or those of the lowest pair or pairs homogamous, sometimes male. *Sessile spikelets* of heterogamous pairs more or less flattened dorsally, but with rounded sides, awned, very rarely awnless, falling with the adjacent internode of the rhachis and the accompanying peduncle; callus short, obtuse, or more often acute to pungent, shortly bearded. *Flower* 1. *Glumes* equal, more or less chartaceous, mostly thin; lower narrowly truncate, rarely acute, 2-toothed, very rarely 2-awned, with the margins narrowly involute or sharply inflexed towards the tip; upper narrowly and shallowly boat-shaped, rounded on the back below, very rarely awned, finely keeled towards the tip, 3-nerved. *Valves* 2, ciliate or ciliate, one or both glabrous; lower hyaline, 2-nerved (often very faintly), rarely quite nerveless, without a flower or pale; upper stipitiform, delicate at the base, gradually hardened above, 2-toothed, with narrow hyaline margins, awned from the sinus, subtending the bisexual flower; awn distinctly kneed, more or less hirtellous or sub-plumose. *Pale* 0, rarely a small hyaline scale. *Lodicules* 2, glabrous. *Stamens* 3. *Styles* terminal; stigmatic laterally exserted. *Grain* oblong in outline, almost circular to plano-convex in cross-section; embryo about $\frac{1}{2}$ the length of the grain. *Peduncled spikelets* acute, often mucronate or aristulate from the lower glume, usually longer than the sessile spikelet and more distinctly 2-keeled (often from below the middle); peduncle finely filiform or linear, more or less obliquely truncate and sometimes obscurely auricled at the tips. *Valves* usually both developed, rarely the upper or both suppressed; the upper sometimes subtending a male flower.

Perennials or annuals, mostly coarse; culm simple or branched; leaf-blade various; ligule membranous; inflorescence of 2-nate spike-like racemes, each pair subtended by a spathe, two or more pairs of racemes subtended by a common spathe, the whole forming a lax or dense spatheate panicle; rhachis few to many noded, disarticulating; internodes similar to the peduncles.

134i

20. MONOCYMBIUM, Stapf

(under *Andropogon*, Linn.)

Spikelets 2-nate, one sessile, the other peduncled, those of each pair differing in sex and structure. *Sessile spikelets* dorsally flattened, with rounded sides, awned, falling with the adjacent internode of the rhachis and the accompanying peduncle; callus short, obtuse, indistinctly marked off from the lower glume. *Flower* 1. *Glumes* sub-equal, thinly cartilaginous; lower obtuse, with narrow involute margins, not or very obscurely keeled near the tips; upper boat-shaped, rounded on the back, laterally compressed and keeled in the uppermost $\frac{1}{3}$, usually awned, 3-nerved. *Valves* 2; lower hyaline, ciliate, without a flower or pale; upper cartilaginous, with a hyaline base and margins, deeply 2-fid, with a delicate awn from the sinus of the hyaline lobes, ciliate, subtending the bisexual flower. *Pale* 0. *Lodicules* 2, cuneiform, glabrous. *Stamens* 3. *Styles* terminal; stigmatic laterally exserted. *Grain* oblong in outline, slightly compressed; embryo about $\frac{1}{2}$ the length of the grain. *Peduncled spikelets* in outline and size very similar to the sessile but awnless; peduncles linear, truncate at the apex. *Valves* 2, hyaline, both developed; the upper more frequently suppressed, sometimes subtending a male flower.

Perennials ; culm branched ; leaf-blade various ; ligule membranous ; inflorescence a spike-like solitary raceme subtended by a spathe, a number of such racemes forming a spatheate panicle ; spathes coloured, cymbiform ; rhachis many-noded, disarticulating ; internodes similar to the peduncles.

Species 1, extending from the Transvaal and Natal to Pondoland ; also found in tropical Africa.

134j

21. HETEROPOGON, Pers.

(under *Andropogon*, Linn.)

Spikelets 2-nate, one sessile, the other peduncled ; spikelets on lower portion of raceme (1 to many pairs) alike in sex and shape ; spikelets on upper portion of raceme differing in sex and strikingly so in shape. *Spikelets* of homogamous pairs male or neuter, long-persistent. *Sessile spikelets* of heterogamous pairs terete or sub-terete, awned ; callus long, pungent, densely bearded upwards, falling together with the adjacent internode of the rhachis. *Flower* 1, female or bisexual. *Glumes* equal ; lower coriaceous, rarely chartaceous, more or less tightly involute, without keels, with obscure nerves often connected by a few transverse nerves in the upper part, or with prominent mid-nerves ; upper coriaceous, rarely chartaceous, thinner towards the margins, membranous at the tips, 3-nerved, sometimes with a prominent mid-nerve, with a deep longitudinal groove on each side. *Valves* 2 ; lower hyaline, nerveless, without a flower or pale ; upper stipitiform from a very slender hyaline base, cartilaginous upwards and passing into a usually stout kneed awn, subtending the female or bisexual flower. *Pale* small, or 0. *Lodicules* large or more or less reduced. *Stamens* 3, often rudimentary or 0. *Stigmas* exerted terminally or laterally. *Grain* more or less linear in outline, sub-terete, slightly dorsally compressed ; embryo somewhat exceeding the middle of the grain. *Peduncled spikelets* dorsally flattened, usually slightly asymmetric, often somewhat twisted, mucous, imbricate. *Lower glume* herbaceous, many-nerved, winged upwards from one or both keels ; upper membranous, lanceolate-oblong, acute, 3-nerved. *Valves* 2, hyaline, 1-nerved, well developed or more or less reduced ; upper without a flower or pale ; lower sometimes subtending a male flower. *Stamens* 3 or 0.

Perennials or annuals ; culm simple or more often branched above ; leaf-blade narrowly linear, flat or longitudinally folded ; ligule scarious ; inflorescence a spatheate panicle of racemes ; racemes conspicuously dorsi-ventral, with the homogamous pairs of spikelets (and the peduncled spikelet of the heterogamous pair) sub-imbricate on the dorsal side and then bending forward around the sides to form a hollow in which the fertile spikelets are enclosed ; awns of homogamous pairs of spikelets exerted anticously and often intertwisted.

Species 4 ; 1 species in South Africa extending from the Transvaal and Natal to Swellendam ; also found in the central districts, the O.F.S., and Griqualand West.

136

22. THEMEDA, Forsk.

(*Anthistiria*, Linn. f.)

Apparent spikelet consisting of 2 pairs of sessile male or barren spikelets, surrounding (and forming a false involucre) a short rhachis which bears 1 or more bisexual sessile spikelets and 1 or 2 peduncled male or neuter spikelets, the whole subtended by a spathe. *Fertile spikelet* terete ; callus usually acute to pungent, densely bearded. *Glumes* equal, coriaceous except at the sub-membranous tip ; lower tightly involute, not keeled, with the nerves very fine and obscure except in transmitted light ; upper

with a deep longitudinal groove on each side, very firm between and thin along the margins, 3-nerved. *Valves* 2; lower hyaline, nerveless; upper stipitiform, hyaline or with a hyaline base, awnless or with a stout kneed awn, or awn reduced, 1-nerved. *Pale* hyaline, nerveless, small, or 0. *Lodicules* 2, rather large, glabrous. *Stamens* 3. *Styles* distinct; stigmas plumose. *Grain* linear-obovate in outline, sub-terete, grooved on the face. *Upper peduncled and lower sessile spikelets* alike, dorsally compressed, awnless. *Lower glume* more or less herbaceous, 2-keeled; upper membranous, rarely suppressed. *Valves*, if present, hyaline; upper with or without a pale.

Coarse annuals or perennials; leaf-blade various; ligule scarious or membranous; inflorescence of groups of spikelets (racemes), subtended by a spathe, one or more of such racemes subtended by a common spathe and the whole forming a lax panicle; rhachis tough or tardily disarticulating between the homogramous pairs, readily disarticulating below the fertile spikelets.

Species 15-16, natives of tropical and sub-tropical countries; 1 species in South Africa, very common, but particularly abundant in the Transvaal, Natal, O.F.S., Griqualand West, and the central districts.

140

23. ANTHEPHORA, Schreb.

Spikelets 4-6-nate; each fascicle surrounded at the base by a spurious involucre; fascicles of spikelets falling entire; involucre formed by the squarrose hardened lower glumes. *Flower* 1, bisexual, or male and with or without the rudiments of an ovary. *Glumes* very dissimilar; lower always abaxial (in relation to the fascicle), firmly coriaceous, oblong to lanceolate, those of each fascicle confluent into a hardened base with distinct nerves on the inner side; upper hyaline, or coriaceous, or membranous, finely subulate from a small ovate base. *Valves* 2; lower shorter than the glume, hyaline, oblong, 5-7-nerved, without a flower or pale; upper equalling the lower, firmer, 3-nerved, subtending the flower. *Pale* equalling the valve, 2-nerved. *Lodicules* 3. *Ovary* ellipsoid; style free or nearly so, very slender; stigmas slender, plumose, exserted from or near the apex, *Grain* ellipsoid, enclosed in the spikelet; hilum punctiform; embryo large, about $\frac{1}{2}$ the length of the grain.

Perennials or annuals; culm tufted and erect, or ascending from a prostrate base; leaf-blade often short, often thickened on the margins and more or less undulate; ligule large, scarious; inflorescence a spike bearing the fascicle of spikelets; rhachis angular.

Species several in tropical and sub-tropical countries; 2 species in South Africa, found in S.W. Africa, the Transvaal, and Basutoland.

143

24. TRAGUS, Haller

Spikelets sessile, in clusters of 2-5, all fertile, or more often one more or less reduced; clusters of spikelets deciduous. *Flower* 1. *Glumes* very dissimilar; lower facing the rhachis, minute, hyaline, sometimes suppressed; upper exceeding the valve, membranous, 5-ribbed or 5-nerved, with the ribs or nerves hispid or spine-hooked. *Valve* lanceolate or lanceolate-oblong, membranous, 3-nerved. *Pale* as long as the valve, 2-nerved. *Lodicules* 2, broad, cuneate, fleshy. *Stamens* 3. *Styles* distinct, very slender; stigmas narrow, plumose, terminally exserted. *Grain* enclosed by the valve and pale, oblong to elliptic in outline, slightly compressed from the back; hilum punctiform, basal; embryo about $\frac{1}{3}$ the length of the grain.

Annuals or perennials; culm erect, ascending or decumbent; leaf-blade linear, rather rigid, with cartilaginous spinulously ciliate margins; ligule reduced to a delicate ciliate rim; inflorescence a cylindric spike-like panicle

bearing the clusters of spikelets ; main rhachis persistent, often grooved and pubescent on the internodes.

Species 5, all African, except 1 species which is found in most warm countries ; 2 species in South Africa, widely distributed.

143a

25. MOSDENIA, Stent

Spikelets solitary, sessile, muticous, sub-falcate, arranged in more or less irregular whorls, falling entire ; callus short, blunt, hirsute. *Flower* 1. *Glumes* sub-equal to equal ; lower rigidly membranous, slightly longer and broader than the upper, cymbiform, falcate, with a prominent scabrid keel ; upper fleshy, sub-falcate, slightly gibbous at the base. *Valve* hyaline, 1-nerved or sub-3-nerved ; callus minute, glabrous. *Pale* nearly equalling the valve, minutely bilobed, faintly 2-nerved. *Lodicules* 2, broadly truncate or emarginate. *Stamens* 3. *Ovary* ovoid ; styles short, united at the base ; stigmas laterally exserted near the base. *Grain* ovoid ; hilum basal, punctiform ; embryo equalling about $\frac{1}{3}$ of the grain.

A prostrate ascending stoloniferous perennial ; stolons covered with short dry densely imbricating scales ; leaf-blade flat, narrowly-linear ; ligule short, membranous, ciliate ; inflorescence a terminal solitary spike ; rhachis notched, sulcate, scabrid.

Endemic ; species 1, found in the Waterberg district of the Transvaal.

148

26. PEROTIS, Ait.

Spikelets solitary, sessile or sub-sessile, very small, narrow, falling entire ; rhachilla not produced beyond the valve. *Flower* 1. *Glumes* equal and similar, rigidly membranous, linear or linear-lanceolate, each passing into a capillary awn. *Valve* much shorter than the glumes, delicately hyaline, lanceolate, acute, 1-nerved. *Pale* hyaline, very minute, nerveless. *Lodicules* 2, broad, cuneate. *Stamens* 3. *Styles* short, united at the very base ; stigmas plumose, laterally exserted. *Grain* cylindric, slender, exserted from the unchanged valve and pale and enclosed with them in the glumes ; embryo about $\frac{1}{3}$ the length of the grain ; hilum basal, punctiform.

Annuals or sub-perennials ; culm leafy ; leaf-blade usually broad, rigid, ciliate ; ligule hyaline, sometimes very short ; inflorescence a spike or pseudo-spike, slender, crinite from the long capillary awns.

Species 4 or 5 in the tropical and sub-tropical regions of the Old World ; 1 species in South Africa, extending from the Transvaal into Swaziland and Natal.

153

27. ARUNDINELLA, Raddi.

Spikelets solitary on very short branches, or 2-nate and unequally peduncled and either both alike or the shorter peduncled spikelet very unlike its companion, not or imperfectly jointed on the peduncles ; callus very short, obtuse, hairy ; rhachilla disarticulating between the valves, not produced beyond the upper valve, glabrous. *Flowers* usually 2 ; upper bisexual ; lower, when present, male, rarely bisexual. *Glumes* persistent, membranous, acuminate, strongly 3-6-nerved ; upper usually longer ; lower sometimes scabrid on the keel. *Valves* 2 ; lower thin, equalling the lower glume or slightly longer or shorter, sub-acute or minutely truncate, 3-7-nerved, sometimes without a flower ; upper finally cartilaginous, terete, rarely dorsally sub-compressed, entire or minutely bifid, with the lobes sometimes produced into fine bristles, 3-7-nerved, minutely scaberulous ; awn terminal or from between the lobes, short, kneed or straight, sometimes absent. *Pales* linear, 2-keeled, with the flaps more or less auricled. *Lodicules* 2, cuneate, rather fleshy. *Stamens* 3. *Ovary* oblong in outline ; styles

distinct or connate at the base ; stigmas plumose, laterally exserted. *Grain* oblong in outline or ellipsoid, terete or dorsally sub-compressed, tightly embraced by the valve and pale, free ; hilum punctiform ; embryo large ; endosperm hard.

Perennials, rarely annuals ; leaf various ; ligule short, ciliate ; inflorescence a panicle, usually rather stiff ; branches stiff, divided from the base.

Species about 25, spread over the tropics of both hemispheres ; 2 species in South Africa, extending from the Transvaal and Natal through the coastal belt to the George district.

154

28. MELINIS, Beauv.

Spikelets peduncled, linear-oblong in outline, laterally compressed, falling entire ; peduncles capillary. *Flower* 1. *Glumes* very dissimilar ; lower reduced to a minute scale ; upper membranous, shortly 2-lobed, mucronulate or shortly awned from the sinus, prominently 7-nerved, with the nerves not anastomosing, glabrous or rarely hairy. *Valves* 2, very dissimilar ; lower rather like the upper glume but more deeply lobed, usually with a fine awn from the sinus, 5-nerved, without a flower or pale ; upper smaller, very thin and rigidly membranous, minutely 2-lobed, shining, obscurely 3-1-nerved, subtending the bisexual flower. *Pale* equalling its valve, obscurely 2-nerved. *Lodicules* 2, very delicate. *Stamens* 3. *Styles* free, slender ; stigmas plumose, laterally exserted. *Grain* terete, linear-ovate in outline, greenish-yellow and faintly marked with purple, or brownish ; hilum basal, small ; embryo equalling nearly $\frac{1}{2}$ of the grain.

Perennials or annuals ; culm ascending from a prostrate very slender many-noded branched base ; leaf-blade narrow ; sheath finely tubercled ; ligule reduced to a fringe of short hairs ; inflorescence a contracted and narrow or open and spreading panicle ; panicle much divided, with capillary branchlets ; spikelets usually purple, at least at the tip.

Species few, in the tropical and sub-tropical parts of the Old and New World ; 1 species in South Africa, recorded from the Transvaal and Natal.

161

29. PASPALUM, Linn.

Spikelets solitary or paired, sub-sessile or unequally peduncled, secund and abaxial, orbicular to oblong, usually most decidedly plano-convex, falling entire ; peduncles short, rudimentary or well developed. *Flower* 1. *Lower glume* typically suppressed, very rarely represented by a small scale ; upper membranous more or less equal to the spikelet, rarely shorter or absent, convex, 3- or more-nerved, with the nerves curved. *Valves* 2 ; lower very similar to the glume, but usually flat or at least less convex, rarely sub-concave, with the middle nerve sometimes suppressed, without a flower or pale ; upper valve chartaceous to crustaceous, obtuse, emucronate, faintly nerved, with firm margins, subtending the bisexual flower. *Pale* sub-equal to its valve and similar in substance, tightly embraced by the narrowly involute margins of the valve. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct or connate at the base ; stigmas laterally exserted near the tip of the spikelet. *Grain* tightly enclosed by the slightly hardened valve and pale, more or less biconvex ; scutellum orbicular-elliptic, shorter than half the grain ; hilum sub-basal, punctiform.

Mostly perennials of varying habit ; ligule membranous, sometimes with hairs from the back ; inflorescence of spike-like racemes ; rhachis dilated or narrow.

Species very numerous, especially in tropical America ; 2-3 species in South Africa, probably introduced ; fairly widely distributed.

161a

30. ALLOTEROPSIS, Presl.

(Axonopus, Hook. f.)

Spikelets 2-3-nate or fascicled, secund and abaxial, ovate or elliptic to lanceolate-oblong in outline, acute, sometimes acuminate, slightly or conspicuously compressed from the back, mostly awned, falling entire from the peduncles. *Flowers* 2; upper bisexual; lower usually male. *Glumes* unequal; lower smaller, membranous to hyaline, very acute, often mucronulate, 3-1-nerved; upper equal or sub-equal to the spikelet, membranous to chartaceous, 5-nerved, with the outer nerves sub-marginal, densely ciliate along the nerves, sometimes the margins expanded into broad wings. *Valves* 2; lower resembling the upper glume but eciliate, minutely truncate at the apex, with the lateral nerves approximate to each other and in or near the marginal flexure; upper chartaceous, mucronate or produced into a straight awn, glabrous, delicately ciliate upwards, 5-nerved. *Pales* with broadly auricled flaps; lower short, deeply 2-fid; upper equal to its valve, 2-keeled. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct; stigmas laterally exerted. *Grain* enclosed by the valve and pale, elliptic-oblong in outline, much compressed; scutellum about half the length of the grain; hilum basal, punctiform.

Perennials or annuals; leaf-blade flat, or more or less convolute; ligule membranous, ciliate or ciliate, short or reduced to a mere rim; inflorescence of more or less spike-like digitate or sub-digitate racemes; racemes sessile or peduncled; rhachis triquetrous.

Species 5, natives of the tropics and warmer temperate zone of the Old World; 1 species in South Africa, extending from the Transvaal and Natal through the coastal belt to the Alexandria district; also found in Griqualand West and the O.F.S.

164

31. ERIOCHLOA, H.B. and K.

Spikelets 2-nate or solitary, peduncled, secund and adaxial, rarely indefinitely orientated, ovate-lanceolate to oblong in outline, slightly compressed from the back, acute, sometimes acuminate, sometimes finely and shortly awned, falling entire from the peduncles. *Flowers* 2 or 1; upper bisexual; lower, where present, male. *Glumes* very unequal; lower reduced to a small nerveless scale clasping the base of the spikelet, or a minute cupular rim clasping the callously thickened bead-like lower internode; upper membranous, corresponding in outline and size to the spikelet, sometimes shortly awned, faintly 5-nerved, with the sub-marginal nerves sometimes obscure. *Valves* 2; lower very like the upper glume if not slightly shorter, empty or subtending a male flower; upper chartaceous to almost crustaceous, glabrous or very minutely puberulous at the apex, faintly 5-nerved, with a fine barbellate mucro of varying length. *Pales* usually 2; lower sub-equalling its valve or quite suppressed; upper equal to the valve, 2-keeled, with moderately narrow flaps. *Lodicules* 2, broadly cuneate, sometimes quite suppressed. *Stamens* 3. *Styles* distinct or united at the base; stigmas laterally exerted near the tips of the spikelets. *Grain* enclosed by the upper valve and pale and falling with them and the tightly appressed lower valve and upper glume, dorsally compressed; scutellum rather exceeding the middle of the grain; hilum sub-basal, punctiform.

Perennials or annuals; leaf-blade more or less flat; ligule reduced to a ciliate rim; inflorescence a simple more or less spike-like raceme, or the racemes branched from a common rhachis, so as to form a narrow panicle; racemes peduncled or the upper sub-sessile; rhachis triquetrous.

Species about 25; 2 species in South Africa, found in the Transvaal.

32. PANICUM, Linn.

Spikelets usually solitary, more rarely 2-nate and unequally peduncled, lanceolate, oblong, elliptic, or orbicular in outline, symmetric in profile, rarely somewhat oblique, falling entire or almost so; peduncles often elongated. *Flowers* 2 or 1; upper bisexual; lower, when present, male. *Glumes* more or less herbaceous-membranous; lower often very much shorter than the upper, rarely equalling it, usually with 1 or more nerves or, if very small, nerveless, very rarely deeply 3-4-fid; upper as long as the spikelet, rounded on the back, entire, very rarely deeply 3-4-fid, 5-9-nerved. *Valves* 2; lower very similar to the upper glume, equally rounded and curved on the back, 3-11-nerved, empty or sometimes subtending a male flower; upper sub-coriaceous to coriaceous, with firm margins, obtuse to sub-acute, emucronate, faintly or more rarely distinctly nerved. *Pales* 2; lower thinly membranous to sub-hyaline, sub-equal to the valve or more or less reduced, rarely suppressed; upper sub-equal to the valve and of similar substance, tightly embraced by the more or less involute margins of the valve. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct; stigmas laterally exerted near the tip of the spikelet. *Grain* tightly enclosed by the hardened valve and pale, dorsally compressed, biconvex to almost plano-convex; scutellum elliptic to ovate-elliptic, about half as long as the grain; hilum sub-basal, punctiform.

Perennials or annuals, rarely suffrutescent, varying in habit and size; leaf-blade mostly linear to linear-lanceolate, sometimes ovate, filiform, or subulate; ligule various, sometimes a minute line of hairs and almost obsolete, sometimes a dense fringe of hairs, or membranous and long-ciliate, or more rarely hyaline and finely ciliate; inflorescence a contracted or open panicle, without a definite orientation of the spikelets towards the axis.

Species about 400, found in the warmer parts of both hemispheres; 20 (about) species in South Africa, widely spread; particularly abundant in the Transvaal and Natal.

33. UROCHLOA, Beauv.

(under *Panicum*, Linn.)

Spikelets solitary, 2-nate, or in fascicles of 3-4, sessile, sub-sessile, or peduncled, secund and abaxial on the rhachis, broadly ovate to elliptic- or lanceolate-oblong in outline, usually more or less flattened or slightly depressed abaxially, convex on the back, awnless, glabrous or hairy, falling entire from the peduncles; peduncles usually much reduced and disc-tipped or if 2-nate then the primary slightly longer. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* similar and sub-equal, or more often dissimilar and very unequal in length; upper longer than the lower, resembling and more or less equalling the lower valve, 5-11- (mostly 7-) nerved, with the nerves evenly distributed. *Valves* 2; lower 5-7- (rarely more-) nerved, with the inner lateral nerves somewhat distant from the midrib, subtending a pale, and sometimes a male flower; upper elliptic to rotundate-elliptic, very obtuse, with a usually scabrid or barbellate mucro, crustaceous, with firm narrowly-involute margins, faintly 5-7-nerved, subtending the bisexual flower. *Pales* 2; lower sub-equal to its valve, with well developed inflexed flaps and sharp, sometimes marginate, keels; upper almost as long as its valve, 2-keeled, of the same texture as the valve, with its sides embraced by the valve all along. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct; stigmas plumose, laterally exerted upwards. *Grain* tightly enclosed by the more or less hardened valve and pale, broadly

to rotundate-elliptic in outline, dorsally compressed, more or less flattened on both faces, with broadly rounded sides ; hilum sub-basal, punctiform ; embryo $\frac{1}{2}$ - $\frac{3}{4}$ the length of the grain.

Perennials or annuals ; leaf-blade linear to lanceolate, flat ; ligule reduced to a ciliate rim ; inflorescence of sessile or sub-sessile racemes on a common axis ; racemes simple or nearly so ; rhachis more or less triquetrous, with a low almost straight or zigzag facial angle or keel, rarely strap-shaped, bearing the contiguous or slightly discontinuous, 2- or irregularly pluri-seriate spikelets alternately to the right and the left of the facial angle.

Species about 18, in the warmer parts of the Old World ; about 5 species in South Africa, extending from the Transvaal, O.F.S. and Natal into the coastal districts of the Cape Province.

166b

34. BRACHIARIA, Gris.

(under *Panicum*, Linn.)

Spikelets solitary or 2-nate, more rarely in fascicles of 3 or more, peduncled, secund and abaxial, oblong to ovate- or elliptic-oblong in outline, usually more or less flattened or slightly depressed, convex on the back, awnless, glabrous or hairy ; peduncles when solitary short or very short, when 2-nate the primary slightly to very much longer. *Flowers* sometimes 2 ; upper bisexual ; lower, when present, male. *Glumes* dissimilar and mostly very unequal in length ; upper longer than the lower, more or less equalling the lower valve, 5-9-nerved, with the nerves evenly distributed. *Valves* 2 ; lower 5-7-nerved, with the lateral nerves some distance from the mid-nerve, sometimes long mucronate, empty, or sometimes subtending a pale or male flower, or both ; upper oblong to elliptic, not mucronate, sometimes contracted into a small projecting point, more or less crustaceous or sub-coriaceous, with firm margins, narrowly involute, faintly 5-nerved. *Pales* 1 or 2 ; lower, when present, usually only slightly shorter than its valve, with well-developed inflexed flaps or the flaps vanishing above the middle ; upper almost as long as its valve, 2-keeled, with its sides embraced by the valve all along, of the same texture as the valve. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct ; stigmas plumose, laterally exerted from the upper part of the spikelet. *Grain* tightly enclosed by the more or less hardened valve and pale, broadly oblong or elliptic in outline, dorsally compressed, more or less flattened on both faces, with broadly rounded sides ; hilum sub-basal, punctiform ; embryo $\frac{1}{2}$ to over $\frac{3}{4}$ the length of the grain.

Perennials or annuals ; leaf-blade linear to lanceolate, usually flat ; ligule reduced to a narrow ciliate or ciliolate rim ; inflorescence of spike-like racemes on a common axis ; racemes usually sub-sessile and solitary, simple or compound near the base, rarely to or beyond the middle, sometimes bare at the base owing to the arrest of spikelets, rarely truly peduncled ; rhachis filiform, triquetrous, or more or less flattened and herbaceous, with a wavy or zigzag midrib which projects as a mostly acute keel on the face, with the spikelets alternately to the right and the left of the facial angle or the midrib ; spikelets closely appressed, always 2-seriate in the plan, but frequently becoming 1-seriate by the dove-tailing of the alternate spikelets of the closely approximate ranks more or less contiguous with their sides, or imbricate and forming dense spike-like racemes, or distant by almost their own length or more.

Species very numerous in the warmer parts of the world ; about 5 species in South Africa, extending from the Transvaal and Natal to the coastal and central districts of the Cape Province ; also found in Namaqualand, Griqualand West, and the O.F.S.

166c

35. ECHINOCHLOA, Beauv.

(under *Panicum*, Linn.)

Spikelets 2-nate or clustered, sessile, sub-sessile, or peduncled, secund and abaxial, ovate to elliptic- or lanceolate-oblong in outline, very convex on the back, flat or slightly depressed in front, usually cuspidate or awned, more or less hispid, falling entire from the peduncles. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* unequal, usually hispid on the nerves, rarely almost smooth; lower much shorter than the upper, more or less ovate from a clasping base, 3-5-nerved, often mucronate; upper corresponding in length and outline to the spikelet (as seen from the back) very concave, 5-7-nerved, acute, cuspidulate or cuspidate, rarely produced into a short awn. *Valves* 2; lower very similar to the upper glume and equalling it (excluding the cusps or awns), but flat or depressed on the back and often with a pronounced cusp or awn, usually hispid on the nerves, sometimes subtending a male flower; upper ovate to elliptic-oblong, apiculate or obtuse, very convex on the back, sub-coriaceous or crustaceous, polished, faintly 5-nerved, with the margins firm and involute up to near the tip then flat, not embracing the tip of the pale, subtending a bisexual flower. *Pales* 2; lower hyaline, equal to the body of its valve, finely 2-keeled, sometimes more or less reduced; upper sub-equal to its valve and similar in substance, with rounded keels and flaps which become thinner towards the flat slightly recurved tips. *Lodicules* 2, cuneate, fleshy. *Stamens* 3. *Styles* distinct; stigmas plumose, exerted from near the tip of the spikelet. *Grain* broad-elliptic in outline, dorsally flat, ventrally convex; hilum sub-basal, punctiform; embryo elliptic-oblong or ovate, exceeding the middle of the grain.

Perennials or annuals: leaf-blade linear from a slightly constricted or equally wide, rarely much attenuated base; ligule 0 or represented by a transverse fringe of hairs; inflorescence a panicle of crowded or loosely arranged secund spike-like branches; branches mostly bearing spikelets from the base or near it.

Species about 25 in the warmer parts of the world; 7 or 8 species in South Africa, extending from the Transvaal and Natal through the coastal districts to the Cape; also found in Bechuanaland.

166d

36. SACCIOLEPIS, Nash

(under *Panicum*, Linn.)

Spikelets solitary, peduncled, oblong, elliptic, or lanceolate in outline, sub-terete or laterally compressed, frequently more or less oblique at the base, falling entire; peduncle short, finely filiform. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* unequal; lower much shorter than the upper, softly or rigidly membranous, with a hyaline margin or tip, sometimes reduced to a small hyaline scale; upper membranous, always much concave, curved or basally gibbous or saccate on the back, usually 7-9-nerved, sometimes 5-13-nerved, with hyaline margins or tip. *Valves* 2; lower very much like the upper glume but with a straighter back, equalling or sub-equalling it, sometimes subtending a male flower; upper oblong, very convex, chartaceous, becoming crustaceous, with firm narrowly-involute margins, obscurely 5-nerved. *Pales* 2; lower sometimes much reduced; upper equalling its valve and tightly embraced by it, 2-nerved, very faintly keeled. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct; stigmas long, exerted from the apex of the spikelet. *Grain* tightly enclosed by the somewhat hardened valve and pale, elliptic in outline, dorsally compressed, with an almost flat back and convex face; hilum punctiform.

Annuals or more often perennials; leaf-blade linear and flat, or filiform and convolute, or subulate; ligule membranous or hyaline; inflorescence a spike-like, very rarely an open panicle.

Species about 30, found in the tropics of both hemispheres; 3 species in South Africa, recorded from the Transvaal and Natal.

166e

37. DIGITARIA, Hall.

Spikelets solitary, or usually 2-3-nate, more rarely 4-6-nate, secund and abaxial, peduncled, lanceolate to elliptic-oblong in outline, flat or more or less concave in front, convex on the back, closely appressed to the rhachis, more or less imbricate, or lax to very lax, usually silky, though often apparently glabrous, rarely quite glabrous, falling entire; peduncles unequal. *Flower* 1. *Glumes* very dissimilar; lower a minute membranous scale or a very delicate readily disintegrating hyaline membrane, sometimes quite suppressed; upper membranous, sometimes very thin, appressed to the back of the upper valve, and as long as or shorter than it, 5- (or more often 3-) nerved, very rarely 1-nerved or almost nerveless, sometimes quite suppressed. *Valves* 2; lower sometimes resembling the upper glume, but generally larger and determining the outline and size of the spikelet, 7-5-nerved, very rarely 3-nerved, with the nerves parallel and prominent if not obscured by hairs, rarely reduced to a small scale, not subtending a flower; upper chartaceous to sub-chartaceous, with thin hyaline margins, faintly 3-nerved, subtending the bisexual flower. *Pales* 2; lower minute; upper equal or sub-equal to its valve and of the same texture, embraced by it all along, finely 2-nerved. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct; stigmas laterally exerted near the top of the spikelet. *Grain* tightly enclosed by the slightly hardened valve and pale, oblong, more or less compressed dorsally, plano-convex in cross-section, with rounded sides; hilum sub-basal, punctiform; embryo usually less than $\frac{1}{2}$ the length of the grain.

Perennials or annuals, very rarely suffrutescent; leaf-blade linear to linear-lanceolate, usually flat, often more or less flaccid; ligule membranous; inflorescence a number of spike-like racemes on a common axis; racemes sessile, digitate or more or less distant, sometimes bare at the base owing to the arrest of the spikelets, rarely truly peduncled, simple or sometimes compound near the base; rhachis triquetrous, with narrow green margins or herbaceous wings on the lateral angles, or flattened with a terete midrib.

Species numerous, found in most parts of the world; 14 or 15 species in South Africa, widely spread, but particularly abundant in the Transvaal and Natal.

166f

38. LEUCOPHRYS, Rendle

(under *Panicum*, Linn.)

Spikelets solitary, 2-nate or fascicled, more or less peduncled, ovate-lanceolate in outline, very slightly compressed dorsally, acuminate, indistinctly or irregularly orientated with regard to the rhachis, falling entire. *Flowers* 2; upper bisexual; lower male. *Glumes* as long as the spikelet, or the lower shorter, separated by a distinct internode, whitish, delicately membranous, or the upper firmer below the middle, softly hairy; lower 1-5-nerved; upper 5-7-nerved. *Valves* 2; lower equalling the upper glume, hairy, subtending a male flower; upper at length crustaceous, sub-acute to obtuse, faintly 5-nerved, smooth, glabrous, subtending a bisexual flower. *Pales* 2; lower equalling its valve or shorter, 2-keeled; upper equalling its valve and of a similar substance. *Lodicules* 2, cuneate, fleshy. *Stamens* 3. *Styles* distinct; stigmas plumose, exerted sub-terminally.

Perennials or annuals; leaf-blade linear, glaucous, attenuated into fine hardened almost spinous points; ligule reduced to a fringe of minute hairs or 0; inflorescence a narrow panicle; branches loose or much contracted and clustered; rhachis slender.

Endemic; species 2, found in S.W. Africa and Bushmanland.

166g

39. ACROCERAS, Stapf

(under *Panicum* Linn.)

Spikelets usually 2-nate, or the upper on the raceme solitary, rarely fascicled, peduncled, second and abaxial, ovate-oblong to oblong in outline, terete, bluntly and callously crested, disarticulating below the glumes, glabrous. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* sub-similar, membranous, pale below, greenish upwards or greenish all over, with a dark green laterally compressed tip; lower glume usually shorter than the upper, more or less ovate-lanceolate, 3-nerved; upper oblong, 5-nerved. *Valves* 2; lower equalling and very similar to the upper glume, sometimes subtending a male flower; upper sub-coriaceous, smooth, oblong, obscurely keeled or broadly rounded on the back, narrowly involute, with fine margins, laterally compressed at the apex, faintly 5-nerved. *Pales* 2; lower equal to or slightly broader than its valve, finely 2-keeled; upper equalling the valve, with rounded keels, with each keel ending in a minute more or less recurved callus tip. *Lodicules* 2, cuncate, fleshy. *Stamens* 3. *Styles* distinct; stigmas large. *Grain* tightly enclosed by the hardened valve and pale, oblong in outline, dorsally flat, ventrally convex; hilum filiform, as long as or much shorter than the grain, rarely punctiform; embryo obovate, short.

Perennials or annuals, usually with a long prostrate and rooting base; leaf-blade flat, lanceolate to linear, with numerous short and more or less distinct transverse veins; ligule reduced to a ciliated rim or quite obscure; inflorescence of simple or branched spike-like racemes on a common axis.

Species about 9, found in the tropics of both hemispheres; 1 species in South Africa, recorded from the Transvaal and Natal.

168

40. TRICHOLÆNA, Schrad.

Spikelets solitary, peduncled, oblong in outline, laterally compressed, more or less gaping, falling entire, often completely enveloped by soft shining hairs; peduncles capillary or sometimes narrow-linear; with thickened tips. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* very dissimilar or at least unequal; lower reduced to a minute scale or obsolete, very rarely half the length of the spikelet, somewhat remote from the upper; upper membranous, gibbous at or below the middle, emarginate or bilobed, mucous or finely mucronate or awned from the sinus, hairy with long silky hairs, 5-nerved, with the nerves faint and anastomosing below the obtuse tips. *Valves* 2; lower more or less like the upper glume, usually subtending a male flower; upper smaller than the lower, thinly chartaceous, obtuse or sub-emarginate, more rarely truncate and minutely notched, obscurely 5-nerved, shining, glabrous, subtending the bisexual flower. *Pales* 2; lower sub-equal to its valve, hyaline, 2-nerved; upper equal to its valve, 2-nerved, of similar substance. *Lodicules* 2. *Stamens* 3. *Styles* free, slender; stigmas densely plumose, laterally exerted. *Grain* oblong-ellipsoid, closely embraced by the valve and pale; hilum basal, punctiform; embryo about $\frac{1}{2}$ the length of the grain.

Perennials, rarely annuals; leaf-blade linear to setaceous; ligule a fringe of hairs; inflorescence an open or contracted panicle; branchlets capillary.

Species about 14; 3 species in South Africa, with a wide distribution.

168a

41. *XYOCHLÆNA*, Stapf(under *Panicum*, Linn.)

Spikelets solitary, peduncled, oblong or ovate-oblong in outline, more or less gaping, falling entire, glabrous, pubescent, or villous (but not with long enveloping hairs); peduncles capillary. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* very unequal; lower often reduced to a minute scale; upper not gibbous, emarginate, muticous or minutely mucronate, 5-nerved, glabrous, pubescent, or shortly villous. *Valves* 2; lower like the upper glume, usually subtending a male flower; upper smaller than the lower, membranous or chartaceous, shining, obtuse or sub-emarginate, obscurely 5-nerved, glabrous, subtending a bisexual flower. *Pales* 2; lower hyaline, 2-nerved, sub-equal to its valve; upper equal to its valve, 2-nerved. *Lodicules* 2. *Stamens* 2. *Styles* free, or connate at the base, slender.

Perennials; leaf-blade linear to setaceous; ligule a fringe of hairs; inflorescence an open or contracted panicle; branchlets capillary.

Species few; 3-4 species in South Africa, extending from the Transvaal into Natal, Bechuanaland, and Namaqualand; 1 species extends into the central districts of the Cape Province.

169

42. *OPLISMENUS*, P. Beauv.

Spikelets solitary, 2-nate or in small clusters, peduncled, secund and abaxial, oblong, ovate-oblong, or lanceolate in outline, falling entire. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* similar in shape and texture, sub-equal, herbaceous to membranous, 3-7-nerved, more or less keeled upwards, both or at least the lower awned and the awn of the lower glume the longer. *Valves* 2; lower exceeding the glumes and resembling them, 5-9-nerved, muticous, or mucronate, or very shortly awned, sometimes subtending a male flower; upper oblong, broadly involute, with firm margins, muticous, chartaceous to sub-coriaceous, subtending a bisexual flower. *Pales* sometimes 2; lower, when present, sub-equal to its valve, 2-nerved, sometimes reduced or absent; upper equalling and embraced by its valve all along. *Lodicules* 2, broadly cuneate, often very delicate. *Stamens* 3. *Styles* distinct, long; stigmas terminally or sub-terminally exserted, plumose. *Grain* tightly enclosed by the somewhat hardened valve and pale, oblong in outline; hilum oblong, $\frac{1}{3}$ - $\frac{1}{2}$ the length of the grain.

Annuals or usually perennials, often weak, with slender many-noded culms; internodes with a decurrent villous line abaxial to the subtending leaf; leaf-blade flat, thin, often slightly asymmetrical, often minutely cross-veined; ligule thinly membranous, very short; inflorescence of spike-like racemes on a common axis, more rarely the spikelets arising direct from the axis; lower and intermediate racemes mostly distant; upper decreasing upwards and more or less approximate; rachis angular, with the spikelets densely arranged or rarely interrupted.

Species about 15, natives of all warm countries; 1 species in South Africa, extending from the Transvaal and Natal through the coastal districts to the Albany district; also recorded from the central districts.

171

43. *SETARIA*, Beauv.

Spikelets solitary or clustered, sub-sessile, ovate to oblong in outline, subtended by 1 to many bristles (rarely bristles absent in some spikelets), falling entire; bristles persistent, often forming $\frac{1}{3}$ involucre. *Flowers* sometimes 2; upper bisexual; lower, when present, male. *Glumes* membranous; lower generally much smaller than the upper, ovate from a clasping

base, usually 3-5- (rarely 1- or 7-) nerved ; upper usually 3-9-nerved. *Valves* 2 ; lower more or less exceeding and resembling the upper glume, flat or depressed, sometimes subtending a male flower ; upper chartaceous to coriaceous, 5-nerved, finely pitted or transversely rugose, subtending a bisexual flower. *Pales* sometimes 2 ; lower, if developed, almost as long as its valve ; upper sub-equal to its valve and of the same substance. *Lodicules* 2, broadly cuneate. *Stamens* 3. *Styles* distinct ; stigmas laterally exerted. *Grain* tightly enclosed by the hardened valve and pale, oblong or elliptic in outline ; hilum basal, punctiform or orbicular ; embryo about $\frac{1}{2}$ as long as the grain.

Perennials or annuals, of various habit ; leaf-blade usually flat and narrow-linear, sometimes rolled ; ligule usually reduced to a ciliate rim, rarely a distinct membrane ; inflorescence mostly a dense cylindric spike-like panicle, or more or less open ; spikelets either on very short branches which are more or less produced into bristles beyond the spikelets, or on elongated branches and then more distant.

Species about 100, natives of all warm countries ; 14-15 species in South Africa, widely distributed.

174

44. CENCHRUS, Linn.

Spikelets narrow, 1-5 enclosed in an involucre, falling entire with the involucre ; involucre peduncled, consisting of several series of slender or flattened bristles, hardened and connate at the base, one usually longer than the others. *Flowers* sometimes 2 ; upper bisexual ; lower, when present, male. *Glumes* mucicous, unequal ; lower often minute ; upper equalling or slightly shorter than the spikelet. *Valves* 2 ; lower equalling or more often exceeding the upper valve, sometimes subtending a male flower ; upper somewhat firmly chartaceous, subtending a bisexual flower. *Pales* 2, similar to their respective valves. *Stamens* 3. *Style* connate at the base ; stigma plumose. *Grain* free, included in the slightly hardened valve and pale.

Annuals or perennials ; leaf-blade flat and flaccid, or short and rigidly convolute ; ligule membranous, ciliate or reduced to a fringe of hairs ; involucre arranged in simple terminal spikes or racemes.

Species about 12, found in all tropical and sub-tropical countries ; 1 species in South Africa, recorded from Griqualand West and the O.F.S.

175

45. PENNISETUM, Pers.

Spikelets solitary or in clusters of 2-4, oblong or lanceolate in outline, subtended by and deciduous with an involucre of bristles (modified branches) ; bristles sessile or peduncled, simple, rarely branched, naked, scabrid or plumose, rarely reduced to one. *Flowers* 2 ; upper bisexual ; lower, when present, male. *Glumes* usually small and hyaline ; lower sometimes suppressed ; upper rarely $\frac{1}{2}$ the length of the spikelet, if longer then up to 7-nerved. *Valves* 2 ; lower equal and similar to the upper, or more or less reduced and thinner and fewer-nerved, sometimes subtending a male flower ; upper membranous to chartaceous, 5-7-nerved, subtending a bisexual flower. *Pales* 2 ; lower sub-equal to its valve or more or less reduced ; upper sub-equal to its valve and of similar texture, 2-nerved. *Lodicules* small, usually in front of and outside the pale or absent. *Stamens* 3, with the tips of the anthers naked or minutely penicillate. *Styles* slender, distinct or connate. *Grain* enclosed by the more or less hardened valve and pale, broadly oblong in outline, slightly dorsally compressed to subglobose ; hilum basal ; punctiform ; embryo large, $\frac{1}{2}$ - $\frac{3}{4}$ the length of the grain.

Perennials or annuals ; culm simple or often profusely branched ; leaf-blade flat or convolute ; ligule usually reduced to a ciliate rim or a fringe of hairs, rarely membranous ; inflorescence usually a dense spike-like panicle ; branches very numerous all round the axis, very short, simple, with a solitary spikelet, or scantily divided, with the spikelets in clusters of 2-5.

Species many, found in the warmer regions of the world ; about 7 species in South Africa, widely distributed.

180

46. STENOTAPHRUM, Trin.

Spikelets solitary or in fascicles of 2-5, sub-sessile or on short appressed branches, acute or acuminate, immersed in hollows on the rhachis, or very closely appressed to the upper side of the rhachis, falling entire from the rudimentary peduncles. *Flowers* sometimes 2 ; upper bisexual ; lower, when present, male. *Glumes* unequal ; lower membranous, varying from very minute and scale-like to nearly $\frac{1}{2}$ the length of the spikelet, nerveless, broadly truncate, obtuse or emarginate ; upper as long or nearly as long as the spikelet (rarely much smaller and then the two glumes more or less equal), 5-9-nerved. *Valves* 2 ; lower chartaceous to coriaceous, 3-9-nerved, sometimes subtending a male flower ; upper chartaceous to coriaceous, faintly 3-5-nerved, subtending a bisexual flower. *Pales* 2 ; lower as long as its valve ; upper equal to and tightly embraced by its valvè, faintly 2-nerved. *Stamens* 3. *Styles* free ; stigmas plumose. *Grain* oblong in outline, plano-convex ; embryo $\frac{1}{2}$ as long as the grain.

Creeping or prostrate perennials or tufted annuals ; leaf-sheath compressed ; ligule a ring of hairs ; inflorescence a spike-like raceme or panicle ; main rhachis dorsally flattened, more or less triquetrous, continuous or jointed ; rhachis, when branched, with the branches produced into an acuminate tip not exceeding the terminal spikelet.

Species 4, found in the warm coastal regions of both hemispheres ; 1 species in South Africa, extending from Natal along the coast to the Cape.

184

47. OLYRA, Linn.

Spikelets 1-flowered, unisexual, both sexes usually on the same, rarely on different panicles. *Male spikelets* usually on the lower part of the panicle and its branches, smaller than the female spikelets. *Glumes* represented by an obscure ring. *Valve* lanceolate, almost subulate-acuminate or caudate-awned, 2-nerved. *Pale* shorter than the valve, 2-nerved. *Lodicules* 3, rarely 2. *Stamens* 3. *Ovary* 0. *Female spikelets* on the upper part of the panicle, or solitary and terminal. *Glumes* sub-equal and similar, ovate to lanceolate, papery or membranous, 3-9-nerved, transversely veined, persistent ; lower sometimes long caudate-aristate. *Valve* shorter than the glumes, hard and shining, elliptic to lanceolate, obtuse, glabrous. *Pale* similar to and embraced by the valve. *Lodicules* 3, truncate, cuneate. *Stamens* 0. *Ovary* glabrous, acuminate ; styles connate at the base or beyond the middle ; stigmas plumose, terminally exerted. *Grain* tightly enclosed in the hardened valve and pale ; hilum linear, almost as long as the grain ; embryo short.

Tall or dwarf perennials ; leaf-blade (in the South African species) conspicuously broad and flat, acutely acuminate, asymmetric and contracted at the base into a short petiole, with numerous short fine transverse veins (scarcely visible to the naked eye) between the longitudinal veins ; ligule membranous.

Species many, chiefly in tropical America ; 1 species recorded from Zululand.

191

48. POTAMOPHILA, R.Br.

Spikelets solitary, peduncled, sub-terete or slightly laterally compressed, falling entire; peduncles short or long, usually produced at the apex into a hyaline or membranous cup. *Flower* 1. *Glumes* very small, hyaline, nerveless, subulate or elliptic, rounded or lobed at the apex. *Valve* membranous, awnless, prominently 5-nerved, with the nerves raised and sometimes slightly winged. *Pale* 3-nerved, otherwise similar to the valve. *Lodicules* 2, nerved. *Stamens* 6. *Styles* distinct or connate at the base; stigmas plumose. *Grain* obovate in outline, compressed, crowned by the thickened bases of the styles, free, enclosed by the unaltered valve and pale.

Tall and rather slender aquatic grasses; leaf-blade flat or becoming convolute when dry; ligule membranous; inflorescence an effuse or contracted panicle.

Species 3; 1 species in South Africa, extending from the Transvaal and Natal to Kentani.

193

49. ORYZA, Linn.

Spikelets solitary, peduncled, oblong in outline, laterally compressed, falling entire; peduncles annular at the apex. *Flower* 1. *Glumes* scale- or bristle-like, or suppressed. *Valve* chartaceous or almost crustaceous, obtuse or acute, awned or awnless, strongly 3-5-nerved. *Pale* as long as the valve, keeled. *Lodicules* 2-lobed, rarely entire. *Stamens* 6; anthers linear. *Styles* short, free; stigmas laterally exerted. *Grain* narrow, free or adnate to the valve and pale.

Tall, leafy; leaf-blade long, flat; ligule long, firmly membranous; inflorescence a panicle, rarely spike-like.

Species 6, natives of the tropics of both hemispheres; 1 species in South Africa, probably introduced.

194

50. LEERSIA, Sw.

Spikelets solitary, very shortly peduncled, laterally compressed, falling entire. *Flower* 1. *Glumes* suppressed. *Valve* sub-cartilaginous, 5-nerved, awnless, with the keel and margins rigidly ciliate. *Pale* narrow, 3-nerved, sub-cartilaginous except at the hyaline margins, grooved along the outer nerves, tightly clasped by the inflexed margins of the valve, with the keel rigidly ciliate. *Lodicules* 2, fleshy, finely nerved. *Stamens* 6, 3, or 1. *Styles* distinct; stigmas feathery. *Grain* ovate or oblong in outline, compressed, embraced by the valve and pale, free; embryo short.

Perennials; leaf-blade narrow; ligule membranous; inflorescence a panicle, usually flaccid, with very slender branches.

Species about 7, natives of tropical and sub-tropical countries; 1 species in South Africa, extending from the Transvaal and Natal, through the coastal regions to the Robertson district; also recorded from the O.F.S.

201

51. EHRHARTA, Thunb.

Spikelets sometimes solitary, peduncled, laterally compressed, awned or awnless, not falling entire; rachilla disarticulating below the valves, more or less obscurely produced. *Flower* 1. *Glumes* persistent, unequal or sub-equal, membranous. *Valves* 3; the 2 lower empty; the uppermost subtending the bisexual flower. *Empty valves* usually exceeding the glumes, generally more or less cartilaginous, more rarely membranous, often bearded, frequently transversely rugose or tubercled, sometimes 2-lobed, with an awn from the sinus; the upper with a callous appendage

at the base, awned or awnless. *Fertile valve* smaller than the empty valves, membranous to coriaceous or almost hyaline, awnless, sometimes with a knob-like appendage at the base forming a hinge with the appendage of the upper empty valve. *Pale* narrow, keeled, finely 2-nerved, with the nerves very close. *Lodicules* 2. *Stamens* 6 or 3, very rarely 1. *Styles* free, short; stigmas plumose or brush-like, exserted above the base. *Grain* elliptic in outline, much compressed; hilum a fine line almost as long as the grain; embryo about $\frac{1}{3}$ the length of the grain.

Perennials or annuals of very varied habit, sometimes suffrutescent, sometimes bulbous at the base; leaf-blade flat or convolute, sometimes much reduced or suppressed; ligule membranous, usually short or reduced to a narrow rim; inflorescence a panicle or raceme, sometimes very scanty or reduced to a solitary spikelet.

Endemic; species 25 with a fairly wide distribution, especially abundant in the south-western districts.

204

52. PHALARIS, Linn.

Spikelets solitary, shortly peduncled, laterally compressed, not falling entire; rachilla disarticulating above the glumes, not or obscurely produced beyond the terminal valve. *Flower* usually 1, sometimes a second male flower present. *Glumes* sub-equal, boat-shaped, enclosing the valves. *Valves* 3, heteromorphous; the lower 2 usually barren, rarely one subtending a male flower, varying from more than $\frac{1}{2}$ as long as the fertile valve to minute subulate or lanceolate scales, membranous, with a callous base; uppermost subtending the bisexual flower, thin, ultimately rigid, ovate, acute, awnless, 5-nerved. *Pale* almost as long as the valve, 2-nerved (sometimes obscurely so). *Lodicules* 2, hyaline. *Stamens* 3. *Styles* long, distinct; stigmas plumose, exserted from the top of the spikelet. *Grain* much compressed, ovate in outline, enclosed by the valve and pale; hilum oblong, short; embryo equalling $\frac{1}{4}$ the length of the grain.

Annuals or perennials; leaf-blade flat; ligule hyaline; inflorescence a terminal stiff spike-like panicle, sub-capitate or interrupted and lobed.

Species about 10, mostly in the Mediterranean region; in South Africa found as weeds or as escapes from cultivation.

205

53. ANTHOXANTHUM, Linn.

Spikelets solitary, peduncled, oblong to narrow-lanceolate in outline, slightly laterally compressed, not falling entire; rachilla disarticulating above the upper glume, not produced beyond the uppermost valve; the terminal internode rather long, slender and flaccid (at least in the South African species). *Flowers* sometimes 3; the uppermost bisexual; the 2 lower male; sometimes only the bisexual flower present. *Glumes* persistent, membranous, 1-3-nerved, keeled, acuminate; upper longer. *Valves* 3, heteromorphous; the 2 lower barren or subtending male flowers, equal and very similar, membranous, oblong, emarginate or sometimes deeply 2-lobed, strongly laterally compressed, 5-7-nerved, keeled, awned, hairy; awn of lower valve short, $\frac{1}{3}$ - $\frac{1}{2}$ -way below the tip; awn of upper valve longer, knecded from near the base, rarely from the middle; uppermost valve subtending a bisexual flower, much shorter than the other 2, broadly-elliptic, very thin, delicately 7-1-nerved. *Pales* of the 2 lower valves, if present, 2-keeled; of the terminal valve 1-nerved. *Lodicules* 0. *Stamens* 3 in the male, 2 in the bisexual flower. *Styles* distinct, long; stigmas long, exserted from the top of the spikelet, plumose. *Grain* ovoid, slightly laterally compressed; hilum punctiform; embryo $\frac{1}{4}$ the length of the grain.

Perennials or annuals ; leaf-blade flat, usually flaccid ; ligule membranous ; inflorescence a slender very narrow or spike-like panicle, sometimes reduced to scanty racemes, sweet-scented.

Species about 20 ; 5 species in South Africa, extending from the Transvaal and Natal to the coastal districts of the Cape Province.

208

54. ARISTIDA, Linn.

Spikelets solitary, peduncled, narrow, not falling entire ; rhachilla disarticulating above the glumes, not produced. *Flower* 1. *Glumes* usually persistent, narrow, muticous or mucronate, more rarely shortly awned, 1-3-nerved. *Valve* usually convolute, cylindric or oblong-cylindric, varying from chartaceous to hyaline, 3-nerved, with the tip gradually tapering or minutely bilobed, awned, sometimes jointed at or above the middle ; callus villous, shortly bearded, usually pungent ; awn nearly always 3-partite from the base or above the simple base (stipitate), very rarely simple, continuous with the valve, or disarticulating from it, or deciduous with a portion of the valve, straight or twisted at the foot, with the lobes plumose, or the lateral or all the lobes naked. *Pale* small, oblong, 2-nerved or nerveless. *Lodicules* 2, finely nerved. *Stamens* 3. *Ovary* glabrous ; styles free, short ; stigmas plumose, laterally exserted. *Grain* slender, cylindric, sometimes grooved, tightly embraced by the valve ; hilum linear, almost as long as the grain ; embryo short or long.

Annuals or more often perennials, tufted, usually with more or less wiry culms ; leaf-blade narrow, usually convolute ; ligule usually a line of very short hairs ; inflorescence a spike-like or widely effuse panicle, more rarely a raceme.

Species over 100, found in the warm regions of both hemispheres ; about 35 species in South Africa, very widely distributed.

209

55. STIPA, Linn.

Spikelets solitary, peduncled, narrow, not falling entire ; rhachilla disarticulating above the glumes, not produced. *Flower* 1. *Glumes* usually persistent, narrow, muticous or mucronate, 1-3-nerved. *Valve* usually convolute, long or shortly cylindric, rather rigid, acuminate or minutely 2-lobed, awned, 3-7-nerved ; awn terminal, simple, kneed, twisted below and plumose or naked above the knee ; callus usually pungent and bearded. *Pale* enclosed in the valve and either equalling it or much shorter. *Lodicules* 2 or 3, equal and rather large, or one much reduced. *Stamens* 3 ; anthers often barbellate at the apex. *Ovary* glabrous ; styles short, free ; stigmas plumose. *Grain* narrow, sub-terete, tightly embraced by the hardened valve and pale, free ; hilum linear, almost as long as the grain ; embryo small.

Tufted perennials, rarely annuals ; leaf-blade convolute, terete, rarely flat ; ligule membranous ; inflorescence a narrow contracted or effuse and scantily branched panicle, more rarely a contracted raceme.

Species very many, widely distributed over the temperate and tropical regions of the world ; 3 species in South Africa, found in Natal, the coastal districts of the Cape Province, and Namaqualand.

210

56. ORYZOPSIS, Michx.

Spikelets solitary, peduncled, ovate or lanceolate in outline, not falling entire ; rhachilla disarticulating above the glumes, not continued beyond the valve. *Flower* 1. *Glumes* equal or sub-equal, persistent, longer than the valve, thin, usually acute or sub-acuminate, 3-9-nerved, with the side nerves often very short. *Valve* rather rigidly membranous to coriaceous, convolute, more or less flattened from the back, lanceolate or ovate to

obovate, with the tips obscurely 2-lobed, 5- (very rarely 3-) nerved; awn, when present, from the minute sinus, jointed on the valve and easily deciduous, bristle-like, naked. *Pale* shorter than the valve, 2-nerved. *Lodicules* 2, rarely 3, hyaline. *Stamens* 3. *Ovary* glabrous; styles free, short; stigmas plumose, laterally exserted. *Grain* tightly enclosed by the hardened valve and pale, oblong in outline or ovoid, ellipsoid or obovoid, terete; hilum filiform, shorter than the grain, often obscure; embryo small.

Tufted perennials; leaf-blade linear, usually long, flat, flaccid or narrow and convolute; ligule membranous; inflorescence an effuse or more or less contracted panicle, often nodding.

Species about 24, mostly found in the temperate and sub-tropical regions of the Northern Hemisphere; 1-2 species in South Africa, possibly introduced.

216

57. PSEUDOBROMUS, K.Schum.

Spikelets solitary, peduncled, lanceolate in outline, scarcely compressed, not falling entire; rachilla disarticulating above the glumes, produced beyond the base of the valve into a fine bristle. *Flower* 1. *Glumes* persistent, slightly unequal, lanceolate to oblong, 1-3-nerved. *Valve* exserted from the glumes, sub-herbaceous, lanceolate in profile, involute, rounded on the back, passing into a straight awn, or with the awn sub-terminal, 3 nerved; callus very short, obtuse, glabrous. *Pale* equalling the valve, entire, 2-keeled. *Lodicules* 2, hyaline, unequally 2-lobed. *Stamens* 3. *Ovary* oblong in outline, pubescent at the top; styles free, very short; stigmas slender, plumose, laterally exserted. *Grain* unknown.

Perennials; leaf-blade flat, broad-linear, flaccid; ligule membranous; inflorescence a large lax nodding panicle.

Species 2; 1 species in South Africa, recorded from the northern Transvaal.

230

58. SPOROBOLUS, R.Br.

Spikelets small, solitary, peduncled, glabrous; rachilla very short, continuous with the peduncle, tardily disarticulating, only produced in one known species. *Flower* 1 in the African species. *Glumes* equal or unequal, persistent or caducous, 1-nerved or nerveless, emucronate, seldom keeled; lower often very small. *Valve* as long as or exceeding the glumes, sometimes very slightly shorter, mucous, unawned, 1-3-nerved. *Pale* equalling the valve or a little shorter, 2-nerved, often caniculate between the nerves, obtuse, truncate, emarginate or minutely bilobed, sometimes splitting at the base; callus 0. *Lodicules* delicately hyaline, truncate. *Stamens* 2-3. *Ovary* often globose; styles free, short; stigmas plumose. *Grain* either falling entire, or often the pericarp remains attached to the rachilla and the seed alone falls through the bursting of the pericarp; pericarp delicate, loose, more or less swelling in water; hilum basal, punctiform; embryo equalling $\frac{1}{2}$ or less than the length of the seed.

Perennials, sometimes annuals; leaf-blade flat, folded or setaceously convolute; ligule usually a very short fringe of hairs; inflorescence a spike-like or open panicle, often delicately effuse, sometimes of spike-like racemes on a central axis.

Species about 80; 30 species in South Africa, widely distributed.

233

59. POLYPOGON, Desf.

Spikelets solitary, peduncled, or sub-sessile, not falling entire; rachilla disarticulating below the valve, not produced. *Flower* 1. *Glumes* equal or sub-equal, awned from the entire or bilobed tip. *Valve* shorter than the glumes, very thin to hyaline, truncate or emarginate, faintly or obscurely

5-nerved, with the lateral nerves shortly excurrent, or evanescent with the hyaline tips, glabrous; awn very fine, sub-terminal, usually deciduous, sometimes reduced to a mucro or 0. *Pale* 2-keeled, slightly or much shorter than the valve. *Lodicules* 2, delicate. *Stamens* 3. *Ovary* glabrous; styles free, very short; stigmas laterally exserted, loosely plumose. *Grain* oblong in outline, sub-terete, sometimes slightly grooved, enclosed by the unaltered valve and pale; hilum short; embryo small.

Annuals or more or less perennials; leaf-blade flat; ligule scarious; inflorescence a dense cylindric spike-like or somewhat open and lax panicle; spikelets often hidden by the numerous and long awns.

Species about 15, widely distributed in the temperate and warmer regions of both hemispheres; 2 species in South Africa, extending from Natal and the O.F.S. to the coastal and central districts of the Cape Province; also recorded from Namaqualand.

242

60. AGROSTIS, Linn.

Spikelets solitary, peduncled, much gaping, at least temporarily. *Flower* 1. *Glumes* equal or sub-equal, membranous, usually lanceolate and acute, rarely oblong and obtuse, awnless (except in *A. polypogonoides*), usually 1-nerved, keeled. *Valve* equalling or shorter than the glumes, delicately membranous, broadly oblong, usually truncate, awned from the back or awnless, 5- (rarely 3-) nerved, with the side nerves evanescent below and often excurrent into fine mucros or bristles, glabrous or hairy; callus very small, glabrous or minutely hairy, rarely bearded. *Pale* delicate, hyaline, usually shorter than the valve, sometimes much reduced or obsolete, 2-nerved or nerveless. *Lodicules* 2, lanceolate, delicately hyaline. *Stamens* 3. *Ovary* glabrous; styles free, very short; stigmas plumose, laterally exserted. *Grain* free, enclosed in the scarcely altered valve and pale, oblong in outline, more or less dorsally compressed, grooved in front, rarely sub-terete; hilum basal, punctiform; embryo short.

Annuals or perennials of varying habit; leaf-blade usually flat, often flaccid; ligule membranous; inflorescence a panicle; panicle usually much divided, often delicate, more or less effuse or contracted, rarely spike-like; branches and branchlets fine to very fine.

Species numerous; mostly natives of temperate regions; about 12 species in South Africa, with a wide distribution.

247

61. CALAMAGROSTIS, Roth.

Spikelets solitary, peduncled, very narrow, lanceolate, acuminate, not falling entire; rachilla disarticulating above the glumes, not or very shortly continued beyond the valve; peduncle short. *Flower* 1. *Glumes* equal or sub-equal, membranous, very narrow, linear-lanceolate, acuminate, keeled; lower 1-nerved, upper 3-nerved. *Valve* much shorter than the glumes, membranous, narrow, lanceolate in profile, more or less shortly bifid, 5-3-nerved, with a fine short dorsal (rarely sub-terminal) awn, glabrous; callus small, long hairy, with the hairs usually much exceeding the valve. *Pale* as long as the valve or somewhat shorter, 2-nerved. *Lodicules* 2, hyaline. *Antthers* 3. *Ovary* glabrous; styles free, short; stigmas plumose, laterally exserted. *Grain* enclosed by the hardly changed valve and pale, free, sub-terete; hilum small, basal; embryo small.

Usually rather robust perennials; leaf-blade long, linear, flat; ligule scarious; inflorescence a more or less contracted narrow rather dense panicle; panicle with much divided branches and with short branchlets.

Species few, natives of temperate regions; 1 species in South Africa, found in the coastal and central districts of the Cape Province, also in Griqualand West and the Transvaal.

256

62. LAGURUS, Linn.

Spikelets solitary, peduncled or sub-sessile, laterally compressed, not falling entire; rachilla disarticulating above the glumes, more or less continued beyond the valve, with or without a terminal rudimentary valve. *Flower* 1, rarely 2, bisexual. *Glumes* equal or sub-equal, hyaline, very narrow, long-acuminate, 1-3-nerved, with the centre nerve very firm and produced into a densely plumose bristle, sparsely covered with long hairs. *Valve* 1, rarely 2, one or both subtending a bisexual flower, shorter than the glumes, membranous, long acuminate, with the tip 2-setose, 5-nerved, finely awned from the back; callus small, minutely hairy. *Pale* (or pales, when 2 present), 2-nerved, somewhat shorter than the valve. *Lodicules* 2, hyaline. *Stamens* 3. *Ovary* glabrous; styles free, short; stigmas plumose, laterally exserted. *Grain* linear-oblong in outline, laterally compressed, soft, tightly enclosed by the slightly hardened valve; hilum basal, linear-oblong, very short; embryo small.

Annual; leaf-blade flat, soft; ligule membranous; inflorescence a dense spike-like or capitate panicle; panicle softly villous, long-bristly from the plumose glumes and long-awned valves.

Species 1, native of the Mediterranean Region; apparently introduced into South Africa.

257

63. HOLCUS, Linn.

Spikelets solitary, peduncled, pallid, laterally compressed, falling entire, *Flower* 1, sometimes flowers 2, either both bisexual or 1 male. *Glumes* membranous, acute or acuminate, rarely one or both awned, keeled; lower 1-nerved; upper 3-nerved. *Valves* 2, much shorter than the glumes, chartaceous, very obscurely 5-3-nerved, lower subtending a bisexual flower, awnless; upper usually subtending a male flower, sometimes a bisexual flower, or barren, with a dorsal awn. *Pales* narrow, 2-keeled. *Lodicules* 2, delicate. *Stamens* 3. *Ovary* glabrous; styles free; stigmas plumose, laterally exserted. *Grain* laterally compressed, enclosed by the valve and pale and often adhering to the latter, soft; hilum short; embryo small.

Annuals or perennials; leaf-blade flat or convolute when dry; ligule membranous; inflorescence a panicle; panicle usually more or less contracted, sometimes almost spike-like, oblong or interrupted.

Species about 6, mostly indigenous to Europe and the Mediterranean Region: 1 species in South Africa, found in the coastal districts of the Cape Province, also in Namaqualand and the Transvaal; another species found as an introduction.

258

64. PRIONANTHIUM, Desv.

(*Prionachne*, Nees)

Spikelets solitary, 2-nate, or 3-nate, sub-sessile, not falling entire; rachilla not or only very minutely produced. *Flowers* 2, bisexual. *Glumes* persistent, sub-equal, with cartilaginous mucicate-pectinate tubercled or smooth keels and broad membranous margins. *Valves* enclosed by and slightly shorter than the glumes, sub-equal, hyaline, acute, mucicous, 3-nerved. *Pales* slightly shorter than the valves, hyaline, 2-nerved, 2-toothed. *Stamens* 3. *Ovary* glabrous; styles free, short; stigmas shortly plumose, laterally exserted. *Grain* narrow-oblong in outline, free, enclosed by the valve and pale.

Annuals; leaf-blade narrow, flat or becoming convolute; ligule a line of hairs; inflorescence a spike-like panicle or raceme.

Endemic; species 3, found in the coastal and central districts of the Cape Province.

265

65. AIRA, Linn.

Spikelets solitary, peduncled, laterally compressed, not falling entire; rhachilla disarticulating below and also between the valves, not or very minutely produced beyond the upper valve. *Flowers* 2, bisexual. *Glumes* persistent, delicately membranous, equal or sub-equal, acute, 1-nerved, keeled. *Valves* 2, shorter than the glumes, slightly distant, sub-equal, lanceolate, acute, sometimes acuminate, often 2-toothed, rounded on the back, faintly or very obscurely 5-nerved, awned from below the middle or awnless, or sometimes the upper valve awned and the lower awnless; awn kneed, twisted below; callus minute, glabrous or minutely hairy. *Pales* slightly shorter than the valves, narrow, 2-toothed. *Lodicules* 2, delicate. *Stamens* 3; anthers small. *Ovary* glabrous; styles free, short; stigmas plumose, laterally exerted near the base of the spikelet. *Grain* more or less adhering to its valve and pale; hilum oblong, minute; embryo sub-orbicular, $\frac{1}{3}$ - $\frac{1}{6}$ the length of the grain.

Small annuals; culm slender; leaf-blade slender; ligule membranous or hyaline; inflorescence a delicate usually open panicle.

Species about 6, mostly natives of the Mediterranean Region; 1 species in South Africa found in the coastal districts of the Cape Province.

268a

66. POAGROSTIS, Stapf

Spikelets solitary, peduncled, laterally compressed, not falling entire; rhachilla disarticulating above the glumes, obscurely produced beyond the base of the valve. *Flower* 1. *Glumes* persistent, equal, membranous, lanceolate or linear-oblong in profile, acute, closely 3-nerved at the very base, with the middle nerve percurrent or almost so. *Valve* slightly shorter than the glumes, entire, delicately membranous, mucicous, faintly 7-nerved, finely silky villous; callus obscure, glabrous. *Pale* sub-equal to the valve, faintly 7-nerved below the middle. *Lodicules* 2, small, cuneate, glabrous. *Stamens* 3. *Ovary* ellipsoid, glabrous; styles free, short; stigmas plumose, laterally exerted. *Grain* oblong in outline, dorsally slightly compressed, elliptic in cross-section; pericarp sub-crustaceous; hilum obscure; embryo about $\frac{1}{4}$ - $\frac{1}{3}$ the length of the grain.

A delicate annual; leaf-blades flat, narrow, thin; ligule a fringe of hairs; inflorescence a panicle. NOTE.—Closely related to the mucicous species of *Pentastchistis* from which it differs in the spikelet having only one flower.

270.

67. DESCHAMPSIA, Beauv.

Spikelets solitary, peduncled, not falling entire; rhachilla disarticulating above the glumes and between the valves, usually produced beyond the second valve as a naked or penicillate bristle. *Flowers* usually 2, bisexual, very rarely in some spikelets on same inflorescence only 1 bisexual flower present, rarely a third terminal male flower present. *Glumes* persistent, sub-equal, membranous to sub-scarious, acute, keeled, shining, glabrous, rarely puberulous. *Valves* usually 2 and usually both subtending bisexual flowers, rarely a third valve present which is empty or subtends a male flower, sub-hyaline, toothed at the apex, dorsally awned, with the awn slender and twisted at the base. *Pales* narrow, 2-nerved. *Stamens* 3. *Ovary* ellipsoid; styles free; stigmas plumose. *Grain* oblong in outline, free within the pale.

Perennials ; leaf-blade narrow, flat or convolute ; ligule membranous ; inflorescence a narrow dense and contracted or often effuse and lax panicle.

Species about 20, natives of the temperate regions of both hemispheres ; 1 species (almost cosmopolitan) found on the Drakensbergen.

271

68. *TRisetum*, Pers.

Spikelets solitary, peduncled, not falling entire. *Flowers* 2 to several, bisexual or the upper male. *Glumes* persistent, equal or more or less unequal, hyaline, acute, keeled ; upper distinctly 3-nerved ; lower 1-nerved or distinctly 3-nerved. *Valves* 2-6, subtending bisexual or male flowers or the upper without flowers, equalling or exceeding the glumes, membranous, hyaline at the tips, acutely 2-toothed, sometimes with fine short bristles from the teeth, with broad margins, faintly or obscurely 5-3-nerved, awned ; awn from the back near the tip, fine, straight, or kneed and twisted below ; callus minute, more or less hairy or glabrous. *Pales* shorter than the valves, hyaline, 2-keeled, 2-toothed. *Ovary* glabrous ; styles free, very short ; stigmas laterally exerted, plumose. *Grain* oblong in outline, whitish, soft, embraced by the usually slightly hardened back of the valve ; hilum basal, short ; embryo small.

Perennials, rarely annuals ; leaf-blade flat, usually flaccid ; ligule hyaline ; inflorescence usually a contracted spike-like panicle, rarely the panicle open and lax, more or less glistening.

Species 50-60, natives of the temperate region of the northern hemisphere, South America, Australia, and New Zealand ; 1 species in South Africa, found in the coastal and central districts of the Cape Province.

273

69. *AVENA*, Linn.

Spikelets solitary, peduncled, pendulous ; rachilla hairy or glabrous, disarticulating above the glumes and between the valves or only above the glumes, or not at all in cultivated forms. *Flowers* 1-2, rarely 3, bisexual, rarely 1-2 additional male flowers present. *Glumes* persistent, equal or sub-equal, scarious, acute, sometimes acuminate, rounded on the back, 7-11-nerved. *Valves* 3-5 ; the lower subtending bisexual flowers ; the upper barren or subtending male flowers, or quite rudimentary ; normal valves distinctly shorter or just equalling the glumes, sub-herbaceous, with rather rigid scarious tips, acute, sometimes acuminate, bifid, with or without bristles from the lobes, 5-9-nerved ; lower 1-3-awned ; awn dorsal from the middle of the valve or slightly above it, kneed and twisted below, imperfect in the upper valves ; callus short, villous, or imperfect and glabrous in cultivated forms. *Pales* shorter than the valves, 2-keeled, 2-toothed or bifid. *Lodicules* 2, rather large, hyaline, entire. *Stamens* 3. *Ovary* densely villous from the base ; styles free, extremely short, or 0 ; stigmas laterally exerted, plumose. *Grain* oblong in outline, sub-terete, grooved in front, hairy, pallid, somewhat soft or at least easy to cut, tightly embraced by the hardened valve and the pale ; hilum fine, linear, long ; embryo small.

Annuals ; leaf-blade linear, flat, flaccid ; ligule hyaline or scarious ; inflorescence usually a very lax often secund panicle.

Species about 7, natives of the Mediterranean Region, some widely spread as weeds ; 1 species known only in numerous cultivated forms ; 4 species in South Africa, found in the coastal districts of the Cape Province and in the Transvaal.

275

70. AVENASTRUM, Jess.

Spikelets solitary, peduncled, usually erect or sub-erect, not falling entire ; rhachilla more or less long hairy, disarticulating above the glumes and between the valves, sometimes produced into a short bristle beyond the uppermost valve. *Flowers* 3-6 ; all bisexual, or the upper male. *Glumes* persistent, scarious, more or less unequal, acute, sometimes acuminate, more or less distinctly keeled ; lower 1- or 3-nerved ; upper 3- (very rarely 5- to sub-7-) nerved. *Valves* 3-6, the uppermost sometimes rudimentary, usually distinctly exerted from the glumes, more or less herbaceous, with scarious or hyaline tips, often rather firm, acute, sometimes acuminate, bifid, with or without bristles from the lobes, 5-9-nerved, awned ; awn dorsal, from the middle of the valve or slightly above it, kneed and twisted below ; callus short or elongate, villous. *Pales* shorter than the valves, rigidly 2-keeled, with the keels scabrid or rigidly ciliate, 2-toothed or bifid, sometimes rather obscurely so. *Lodicules* 2, rather large, hyaline. *Stamens* 3. *Ovary* hairy from the middle upwards or at the top only ; styles free, short ; stigmas laterally exerted, plumose. *Grain* oblong in outline, slightly laterally compressed, usually grooved in front, hairy at the top, pallid, rather soft, embraced by the somewhat hardened valve and pale ; hilum linear, up to $\frac{1}{2}$ the length of the grain ; embryo small.

Perennials, caespitose ; leaf-blade linear, usually narrow, flat or convolute, often setaceous ; ligule hyaline ; inflorescence a narrow erect often stiff or rarely flaccid or expanded panicle.

Species about 45, natives of the temperate regions of the Old World, North America, and Africa ; 7 species in South Africa, extending from the Transvaal and Natal to the coastal and central districts of the Cape Province.

277

71. TRISTACHYA, Nees

Spikelets in clusters of 3, sessile or shortly peduncled, lanceolate to linear, not falling entire, sometimes deciduous from the jointed peduncles ; rhachilla disarticulating between the valves and less readily or imperfectly below them, not produced beyond the upper valve, glabrous. *Flowers* 2 ; lower male ; upper bisexual. *Glumes* persistent, membranous or sub-coriaceous, more or less unequal, 3-nerved, glabrous, or bristly or villous from black glands. *Valves* 2 ; lower membranous, 3-nerved or 5-9-nerved, with some of the nerves much shorter than the others, sometimes long ciliate from black glands ; upper convolute, membranous or ultimately cartilaginous, bifid, 7- (rarely 5-) nerved, awned from between the lobes ; awn kneed, twisted below, sometimes 3 awns present. *Pales* membranous, hyaline, 2-keeled. *Lodicules* 2, cuneate, very fleshy. *Stamens* 3. *Ovary* ovate or oblong in outline, glabrous or hairy at the top, rudimentary in the male flower ; stigmas plumose, long, laterally exerted. *Grain* obovate to linear-oblong in outline, grooved, tightly embraced by the valve and pale, free ; hilum linear, long ; embryo large, endosperm very hard.

Perennials, generally coarse, grasses, growing mostly in compact tufts ; leaf-blade rigid ; ligule a line of hairs ; inflorescence a panicle or raceme ; racemes with large and few triplets of spikelets ; panicles with smaller and more numerous triplets of spikelets, scantily branched.

Species 25, mostly in tropical Africa ; 5 species in South Africa, widely spread, but most numerous in the Transvaal.

278

72. TRICHOPTERYX, Nees

Spikelets solitary, peduncled, more or less lanceolate to linear in outline, not falling entire ; rhachilla disarticulating between (and less readily below)

the valves, not or very slightly produced beyond the upper valve, glabrous. *Flowers* usually 2; lower male; upper bisexual. *Glumes* persistent, unequal, membranous or sub-coriaceous, 3-(very rarely 4-6-) nerved, glabrous, or bristly or villous from black glands. *Valves* 2; lower barren or subtending a male flower, membranous, muticous, 3- (very rarely 7-) nerved, with the innermost side-nerves much shorter; upper subtending a bisexual flower, terete, membranous to cartilaginous, shortly bifid, with the lobes sometimes produced into bristles, 5-9-nerved, awned; awn from between the lobes, kneed, twisted below; callus small or rather long, acute, obtuse, or 2-fid, bearded. *Pales* membranous, 2-keeled, narrower in the upper valve, channelled between the stout keels. *Lodicules* 2, cuneate, usually very fleshy. *Stamens* 2, rarely 3. *Ovary* oblong in outline, glabrous, rudimentary in the male flower; styles distinct, glabrous; stigmas plumose, long, laterally exerted. *Grain* obovate to linear-oblong in outline, subterete, sometimes grooved, tightly embraced by its valve and pale, free; hilum linear, long; embryo large; endosperm very hard.

Perennials rarely annuals, of varying habit; leaf-blade more or less rigid; ligule a line of hairs; inflorescence usually a contracted narrow panicle.

Species about 25, natives of Africa and Madagascar: 5-6 species in South Africa, found in the Transvaal, Natal, O.F.S., Griqualand West, and Namaqualand.

280

73. DANTHONIA, DC.

Spikelets solitary, peduncled, sessile, or sub-sessile, laterally compressed, not falling entire; rhachilla disarticulating above the glumes and between the valves. *Flowers* 3 to many, rarely only 2; lower bisexual; upper usually male. *Glumes* equal or sub-equal, sometimes enclosing the valves, more or less lanceolate in profile, usually acute, often acuminate, hyaline to scarious or sub-herbaceous, keeled, 3-9- (rarely 1-) nerved, often with transverse veins. *Valves* 3 to many; upper empty or subtending male flowers; uppermost usually rudimentary; normal valves firmly membranous to chartaceous, 7-11-(rarely 5-) nerved, 2-lobed, awned from the sinus or sometimes the lobes reduced to minute teeth and the awn to a mucro, hairy, often with the hairs partly gathered in variously arranged tufts, very rarely glabrescent; lobes of valve free, rarely more or less adnate to the awn, acute or obtuse, with or without a bristle from the tip. *Callus* small, or rather long and acute, hairy. *Pales* 2-keeled, usually entire or almost so, mostly exceeding the insertion of the awn of the valve. *Lodicules* 2, usually large and ciliate, many-nerved, sometimes small, fleshy, glabrous. *Stamens* 3. *Ovary* oblong or obovate in outline, glabrous; styles distinct, slender, long, or short and then sometimes with the stigmatic hairs decurrent on the inner side and joining over the tops of the ovary; stigmas plumose, laterally exerted. *Grain* oblong, obovate, or elliptic in outline, usually semi-terete, rarely almost terete; hilum obscure, oblong, short; embryo $\frac{1}{3}$ - $\frac{1}{2}$ the length of the grain.

Perennials, rarely annuals; leaf-blade very variable; ligule a fringe of hairs; inflorescence a panicle, very rarely a distichous spike; panicle usually with solitary alternating and closely divided branches, often very dense, sometimes compactly capitate.

Species 65-70, natives of Africa, Australia, and New Zealand; 21 species in South Africa, extending from Namaqualand to the Albany district through the coastal strip; also recorded from some of the central districts and the O.F.S.

280a

74. CHÆTOBROMUS, Nees

Spikelets solitary, peduncled, falling entire with the bearded or plumose upper part of the peduncle; rhachilla more or less tough above the glumes, readily disarticulating between the valves. *Flowers* 3-4, bisexual. *Glumes* equal, enclosing the valves, lanceolate in profile, closely nerved. *Valves* slightly heteromorphous, membranous, 7-9-nerved; lowest with an obscure glabrous callus, with a perfect or more or less reduced awn but without bristles, very rarely bristles present, glabrous or with a few scattered hairs; following valves slightly larger or smaller, deeply 2-lobed, with a kneed awn from the sinus and a bristle from the inner side of each lobe, with a slender pungent villous callus, pubescent or glabrous. *Pales* 2-keeled, more or less equalling the valves. *Lodicules* 2, cuneate, glabrous. *Stamens* 3. *Ovary* glabrous; styles distinct, short; stigmas plumose, laterally exerted. *Grain* almost spindle-shaped, or linear-oblong in outline, very slightly compressed from the sides, grooved in front, tightly enclosed by the slightly altered valve and pale; hilum linear, long; embryo short.

Tufted perennials; leaf-blade more or less flat, soft; in florescencea contracted narrow, sometimes very meagre, panicle.

Endemic; species 3, extending from the Cape Peninsula to Namaqualand.

280b

75. PENTASCHISTIS, Stapf

(Achneria, Munro)

Spikelets solitary, peduncled, laterally compressed, more or less glistening, not falling entire; awned or unawned; rhachilla disarticulating above the glumes and between the valves, produced usually as a very minute bristle beyond the upper valve. *Flowers* 2, very rarely 3, bisexual. *Glumes* equal or sub-equal, enclosing the valves, hyaline or sub-hyaline, lanceolate in profile, acuminate, keeled, 1-nerved or closely 3-nerved at the very base. *Valves* 2, rarely 3, shorter than the glumes, membranous, 2-lobed, awnless, or awned from the sinus, rarely only the upper valve awned, with the lobes produced into a fine bristle from the inner angle to which they are often more or less adnate, rarely 3-4-fid with all the divisions bristle-like, finely or obscurely 5-11-nerved, hairy between the nerves, or glabrous except the shortly-hairy callus. *Pales* 2-keeled, 2-toothed, more or less equalling the valves (exclusive of the lobes). *Lodicules* 2, small, cuneate, nerved, usually glabrous. *Stamens* 3. *Ovary* oblong in outline, glabrous; styles distinct, very slender; stigmas plumose, laterally exerted. *Grain* oblong in outline, terete to semi-terete, shallowly grooved in front; hilum obscure, linear-oblong; embryo about $\frac{1}{4}$ the length of the grain.

Perennials, rarely annuals; leaf-blade very variable; ligule a fringe of hairs; inflorescence an open or contracted, sometimes spike-like, panicle, sometimes with the primary branches 2-nate and subdivided dichotomously, or more often trichotomously; branches smooth, finely scaberulous or tuberculate.

Species over 50, mainly African; the bulk in South Africa found chiefly in the south-western districts, but occur in some of the central districts and Natal.

280c

76. PENTAMERIS, Beauv.

Spikelets solitary, peduncled, compressed, not falling entire; rhachilla disarticulating above the glumes and between the valves, continued as a short slender bristle beyond the upper valve. *Flowers* 2, bisexual. *Glumes* equal, enclosing the valves, hyaline, lanceolate-acuminate in profile, keeled, 1-nerved or very closely 3-nerved at the base. *Valves* 2, membranous, 2-lobed, awned from the sinus, 7-11-nerved, more or less hairy; lobes with

a fine bristle from the inner side, usually more or less adnate to it; callus very short. *Pales* 2-keeled, more or less equalling the valves, 2-fid or 2-toothed. *Lodicules* 2, cuneate, nerved, glabrous or ciliate. *Stamens* 3. *Ovary* obovoid, with a very dense deciduous tomentum of branched hairs at the top; styles distinct, short or very short; stigmas plumose, laterally exserted. *Grain* enclosed by the slightly hardened valve and pale; pericarp rather loose and crustaceous; hilum linear; embryo small.

Perennials; culms fasciated from a usually woody or suffrutescent base; leaf-blade rigid or wiry, usually long and filiform; ligule a fringe of hairs; inflorescence a panicle or raceme.

Endemic; species 5, found in the coastal and central districts of the Cape Province.

281

77. MICROCHLOA, R.Br.

Spikelets solitary, sessile, not falling entire, rhachilla disarticulating below the valves and often below the glumes, not or minutely produced in the S.A. species. *Flowers* 1-2, when solitary then bisexual, or if 2 then the lower bisexual and the upper male. *Glumes* persistent or (particularly the upper) deciduous, sub-equal, flattened from the back or keeled, strongly 1-nerved. *Valves* 1 or 2, shorter than the glumes, delicate, white, minutely or obscurely mucronulate or emarginate, 3-nerved, densely hairy along the nerves; upper valve, when present, barren or subtending a male flower, glabrous; callus small, acute, hairy. *Pale* almost equalling or slightly shorter than the valve, 2-keeled. *Lodicules* 2, cuneate, glabrous, thin, faintly nerved. *Stamens* 3. *Ovary* glabrous, quite suppressed in the upper male flower (when present); styles distinct; stigmas plumose, laterally exserted. *Grain* oblong in outline, triquetrous or compressed, embraced by the unchanged valve and pale, free; hilum, punctiform; embryo $\frac{1}{2}$ the length of the grain.

Perennials, rarely annuals, sometimes densely tufted; leaf-blade narrow, often sub-setaceous; ligule reduced to a minutely ciliate rim; inflorescence a solitary terminal spike in the South African species, or a terminal umbel of 2-4 spikes; spikes straight or curved; rhachis flattened, bearing the crowded spikelets on one side in 2 rows from near the margin, or in a single row.

Species few, natives of tropical countries; 3 species in South Africa, with a fairly wide distribution.

282

78. CYNODON, Rich.

Spikelets solitary, sessile, laterally compressed, not falling entire; rhachilla disarticulating above or between the glumes, sometimes produced. *Flower* 1, very rarely flowers 2. *Glumes* keeled, acute; upper 1-3-nerved, usually deciduous with the valve; lower 1-nerved, sub-persistent. *Valve* or valves exceeding the glumes, navicular, firmly membranous, except at the often hyaline tip and margins, 3-nerved, awnless, keeled, with the keel ciliate and wingless or narrowly winged. *Pale* equalling or somewhat shorter than the valve, 2-keeled. *Lodicules* 2, minute, obovate-cuneate, glabrous. *Stamens* 3. *Ovary* glabrous; styles distinct, slightly shorter than the plumose stigmas. *Grain* oblong in outline, sub-terete; hilum linear, $\frac{2}{3}$ the length of the grain; embryo about $\frac{1}{3}$ the length of the grain.

Perennials; stem creeping, rooting at the nodes and emitting from them fascicles of barren shoots and flowering culms; inflorescence a terminal umbel of 2-6 spikes, or spikes in whorls on a common axis; rhachis slender, keeled, bearing the imbricate spikelets on one side alternately in 2 rows.

Species few, one almost cosmopolitan; 6 species in South Africa, found in the Transvaal, Natal, and the coastal districts of the Cape Province; rare in the central and north-western districts.

283

79. SPARTINA, Schreb.

Spikelets solitary, sessile, laterally compressed, falling entire; rhachilla not produced. *Flower* 1. *Glumes* unequal, narrow, 1-5-nerved, keeled. *Valve* equalling or slightly shorter than the upper glume, oblong, 1-nerved, thinly membranous except along the keel. *Pale* delicate, exceeding the valve, 2-nerved. *Lodicules* 0. *Stamens* 3. *Ovary* glabrous; styles very long, connate at the base; stigmas densely plumose, terminally exserted. *Grain* linear or oblong in outline, terete or slightly compressed, included in the valve and pale but not adherent.

Rigid maritime grasses, usually tall and coarse, with tufted or creeping bases; leaf-blade convolute, terete or flattened towards the base; ligule a fringe of hairs; inflorescence an open or contracted panicle composed of secund spikes; posterior side of rhachis appressed to the common peduncle or to each other; rhachis triquetrous, produced beyond the terminal spikelet, bearing the densely imbricated spikelets alternately in 2 rows.

Species 7 or 8; 1 species in South Africa, found in the littorial region of the Cape Province.

285

80. HARPECHLOA, Kunth

Spikelets solitary, sessile, dark olive-grey, not falling entire; rhachilla disarticulating above the glumes, continuous between the valves. *Flowers* 2-3; lowermost bisexual; the following 1 or 2 male. *Glumes* unequal; the lower persistent, keeled, very thin, 1-nerved; the upper about twice as long as the lower, oblong-linear, flattened on the back, 2-3-nerved, firm. *Upper valves*, in the young spikelet at least, crowded in a club-shaped body not exceeding the valve of the bisexual flower, enveloped by the valve of the lower male flower; empty valves and valve subtending the male flowers 2-nerved, obovate or spatulate, with a trace of the middle nerve near the apex, sometimes ciliolate. *Pales* 2-nerved. *Stamens* 3. *Ovary* usually quite suppressed. *Valve* subtending the bisexual flower folded, obliquely oblong in profile, obtuse, white, thin, 3-nerved, densely ciliate along the nerves; callus obscure. *Pale* slightly shorter than the valve, lanceolate, 2-keeled. *Lodicules* cuneate, fleshy, narrowly 2-winged. *Stamens* 3. *Ovary* glabrous; styles distinct; stigmas slender, plumose, laterally exserted. *Grain* free, embraced by the unchanged vale and pale, oblong in outline, obtusely 3-angled; hilum basal, punctiform; embryo $\frac{1}{2}$ the length of the grain.

Perennial, densely caespitose; leaf-blade firm, folded or convolute above, more or less curved; inflorescence a solitary terminal spike, rarely spikes 2-nate; rhachis flattened, bearing the crowded unilateral spikelets alternately in 2 rows along the midrib.

Endemic; species 1, with a fairly wide distribution.

286

81. CTENIUM, Panz.

Spikelets solitary, sessile, not falling entire; rhachilla disarticulating above the glumes, continuous between the valves. *Flowers* 1-3, when more than one then the upper or uppermost bisexual and the others male. *Glumes* unequal; lower persistent, keeled, thin, 1-nerved; upper much longer, oblong to lanceolate, flattened or rounded on the back, firm, 2-3-nerved, with an awn from the middle. *Valves* 3-4, oblong in profile, obtuse, 3-nerved, awned just below the tips, ciliate along the nerves, white, thin; the uppermost sometimes glabrous; the 2 lower barren or one subtending a male flower; the third subtending a bisexual flower; the fourth barren, or subtending a male flower, or quite rudimentary. *Pales* slightly shorter than the valves, 2-keeled or 2-nerved. *Lodicules* 2, quadrate-cuneate or

ovate, delicate, faintly nerved. *Stamens* 3 in the bisexual, 2 in the male flowers. *Ovary* glabrous; styles distinct; stigmas slender, long, laterally exerted. *Grain* free, embraced by the unchanged vale and pale, oblong in outline; hilum basal, punctiform; embryo up to $\frac{1}{2}$ the length of the grain.

Perennials, densely tufted, rarely annuals; leaf-blade narrow, flat or convolute; inflorescence a terminal solitary spike or an umbel of 2-3 spikes; spikes usually curved; rhachis flattened, bearing the compactly crowded unilateral spikelets alternately in 2 rows along the midrib.

Species about 9; natives of North and South America and Africa; 1 species in South Africa, extending from the Transvaal and Natal into Pondoland.

288

82. CHLORIS, Swartz

Spikelets solitary, sessile, not falling entire; rhachilla disarticulating above the glumes, not or more or less produced beyond the terminal valve. *Flowers* sometimes 2-4; the lowest bisexual; the others, when present, male. *Glumes* unequal, persistent, narrow, keeled, acute, mucronate. *Valves* 2-4, the upper barren or subtending male flowers, acute, or obtusely-emarginate, or bilobed, prominently 3-nerved, with the side nerves sub-marginal and often long and densely or sparsely ciliate and with the middle nerve produced into a short or long awn just below the tip; uppermost valve sometimes very minute or reduced to little more than an awn. *Pales* nearly equalling the valves, strongly 2-keeled. *Lodicules* 2, minute. *Stamens* 3. *Ovary* glabrous; styles distinct, short; stigmas plumose. *Grain* narrow-ovate in outline, rather distinctly or obscurely triquetrous; pericarp very thinly and delicately hyaline, loose, swelling slightly in water; embryo rather large; endosperm clear, transparent.

Perennials or annuals; leaf-blade flat or folded; ligule membranous; inflorescence a terminal umbel or raceme of erect or spreading spikes; rhachis slender, bearing the crowded unilateral spikelets in 2 rows.

Species between 30-40, natives of tropical and sub-tropical countries; 5 species in South Africa, with a wide distribution.

288a

83. EUSTACHYS, Desv.

(under *Chloris*, Sw.)

Spikelets solitary, sessile, not falling entire; rhachilla disarticulating above the glumes and produced beyond the terminal valve, sometimes bearing a minute scale. *Flowers* 1-2; lower bisexual; upper, when present, male. *Glumes* persistent, unequal; lower smaller, usually acute, keeled; upper truncate or 2-lobed, rounded on the back, with the mid-nerve produced into a short awn just below the apex. *Valves* 1-2, firmer than the glumes, sub-acute, obtuse or emarginate, 3-nerved, with the side nerves sub-marginal and usually ciliate and the mid-nerve ending abruptly below the apex or produced into a mucro or short awn; upper valve when present sometimes barren. *Pales* slightly shorter than the valves, 2-keeled. *Lodicules* 2, minute. *Stamens* 3. *Ovary* glabrous; styles distinct, short; stigmas plumose. *Grain* narrow-ovate in outline, triquetrous; pericarp very thin and hyaline, loose, swelling very slightly in water; embryo large; endosperm clear, transparent.

Perennials; culm often much branched; leaf-blade flat or folded, often strongly keeled, usually obtuse; ligule short, membranous; inflorescence of 4-8 umbellate or digitate spikes; rhachis slender, bearing the crowded unilateral spikelets in 2-rows.

Species 5-6, mostly in America; 1 species in South Africa, with a wide distribution.

298

84. TRIPOGON, Roth

Spikelets solitary, sessile, not falling entire; rhachilla disarticulating above the glumes and often between the valves. *Flowers* many, bisexual, or the upper male. *Glumes* persistent, dissimilar, 1-nerved; lower usually inaequilateral, with one margin deeply notched or dilated suddenly below the middle into a lobe or wing or segment; upper entire or notched below the mucronate or apiculate tip. *Valves* many, ovate, dorsally convex, 2-fid and awned from the sinus, or 4-fid with the lobes awned and the inner membranous and rarely awned; the upper usually barren or subtending male flowers. *Pales* broad or narrow, complicate, 2-toothed or 2-mucronate. *Stamens* 3. Styles very short, distinct. *Grain* terete or sub-triquetrous, glabrous.

Tufted annuals or perennials, usually small and inconspicuous; leaf-blade flat or more usually convolute; ligule delicately hyaline and fimbriate; inflorescence a terminal solitary often curved spike; rhachis slender, bearing the alternate secund non-imbricating spikelets.

Species about 8, natives of Africa and India; 1 species in South Africa, recorded from the Transvaal.

301

85. TETRACHNE, Nees

Spikelets solitary, sessile, laterally compressed, awnless, falling entire; rhachilla tough or tardily disarticulating between the fertile valves. *Flowers* 3-4, bisexual, or the upper male. *Glumes* thin, acute, 1-nerved, keeled, with the keel narrowly winged. *Valves* 5-6; the 2 lowest barren; the remainder subtending bisexual flowers, or bisexual and male flowers, or some barren; lower barren valves very like the glumes; upper valves rather firm, obtuse, 5-nerved, with a winged keeled. *Pales* slightly shorter than the valves, with 2-winged keels. *Lodicules* 2, cuneate, fleshy, nerved. *Stamens* 3. *Ovary* glabrous; styles distinct, much shorter than the laterally exerted plumose stigmas. *Grain* loosely enclosed by the valve and pale, oblong in outline, sub-terete; hilum basal, punctiform; embryo large.

Tufted perennials; leaf-blade convolute, rigid; ligule a fringe of hairs; inflorescence an uninterrupted compound spike; rhachis flattened, terminating in a spikelet, bearing the unilateral spikelets.

Endemic; species 1, found in the central, north-eastern, and north-western districts.

301a

86. ENTOPLOCAMIA, Stapf

Spikelets solitary or clustered, sessile, mucronate, laterally compressed, falling entire; lowest spikelets of a cluster often male or barren; rhachilla tough, with extremely short internodes. *Flowers* few to 20, bisexual and male. *Glumes* thin, acute; lower strongly 3-nerved; upper 5-nerved. *Valves* few to many; lowest 2 barren, more or less like the glumes; upper valves thin below, with stoutly mucronate sub-recurved tips, prominently 9-11-nerved above, keeled; callus 0. *Pales* as long as the valves, 2-toothed, 2-keeled; keels winged, with a tuft of long delicate wool from the inner base of the broad flaps. *Lodicules* 0. *Ovary* glabrous; styles connate at the very base; stigmas slender, very narrow, plumose, terminally exerted. *Grain* loosely enclosed by the valve and pale, laterally flattened; pericarp thin, loose; hilum basal, punctiform; embryo $\frac{1}{2}$ as long as the grain or less.

Perennial; leaf-blade linear, flat or involute; ligule a hairy rim; inflorescence a simple or compound spike; rhachis angled or flattened, terminating in a spikelet.

Endemic; 1 species found in Namaqualand and Hereroland.

302

87. DINEBRA, Jacq.

Spikelets solitary, sessile, not falling entire ; rhaehilla disarticulating above the glumes and between the valves, produced beyond the terminal valve and sometimes bearing a reduced valve. *Flowers* 2-3. *Glumes* persistent, sub-equal, much exceeding the valves, narrow-ovate, long-acuminate, long-mucronate, 1-nerved, keeled. *Valves* small, hyaline, obtuse, 3-nerved, with the side nerves sub-marginal and evanescent above and the centre nerve prominent, percurrent or minutely excurrent, minutely hairy below. *Pales* hyaline, complicate, 2-toothed, 2-keeled. *Stamens* 3. *Lodicules* 2, minute. *Styles* distinct, short. *Grain* ovoid-triquetrous, free, included in the valve and pale ; hilum basal, punctiform ; embryo small.

Leafy annuals, often decumbent at the base ; leaf-blade flat ; ligule membranous ; inflorescence a long narrow raceme of spikes ; spikes short, erect at first and ultimately deflexed ; rhachis bearing the crowded 2-seriate unilateral spikelets.

Species 1, native of Africa and east India ; recorded from the northern Transvaal.

304

88. ELEUSINE, Gærtn.

Spikelets solitary, sessile, laterally compressed, not falling entire ; rhachilla disarticulating above the glumes and between the valves, or tough, sometimes terminated by a rudimentary valve. *Flowers* 3-6, bisexual. *Glumes* persistent, sub-equal, membranous, obtuse or obscurely mucronate, with a crested rigid keel, 3-5-nerved, with the lateral nerves close to the keel ; lower glume shorter than the upper. *Valves* very similar, 3-nerved near the base ; lateral nerves sub-marginal above, with 1-2 short additional nerves close to the keel. *Pales* slightly shorter than the valves, 2-keeled, with the keels winged. *Lodicules* 2, minute, euneate. *Stamens* 3. *Ovary* glabrous ; styles slender from a broadened base, distinct ; stigmas plumose, laterally exerted. *Grain* broadly-oblong to globose, broadly grooved ; pericarp loose, delicate, breaking up irregularly or almost circumscissile ; seed finely striate ; hilum basal, punctiform ; embryo basal, sub-orbicular.

Annuals or perennials ; leaf-blade flat or folded ; ligule membranous ; inflorescence an umbel of spikes, or of spikes on a common axis ; rhachis flattened, bearing the densely imbricate alternately 2-seriate unilateral spikelets, ending in a perfect spikelet.

Species about 6, natives of Africa and Asia ; 2 species in South Africa, one as a naturalised weed, the other cultivated.

305

89. DACTYLOCTENIUM, Willd.

Spikelets solitary, sessile, laterally compressed, not falling entire ; rhaehilla tardily disarticulating above the glumes, tough between the valves. *Flowers* 2-4, bisexual. *Glumes* unequal, strongly keeled ; the lower persistent, thin, ovate, acute ; the upper deciduous, elliptic-oblong in profile, firm, obtuse, mucronate or awned. *Valves* 3-5, ovate, sub-acuminate, 3-nerved, mucronate or awned, deciduous with the grains ; the uppermost without a flower. *Pales* about as long as the valves, 2-keeled, sub-persistent. *Lodicules* 2, cuneate, minute. *Stamens* 3. *Ovary* glabrous ; styles distinct, very long, sub-terminally exerted. *Grain* sub-globose, slightly laterally compressed, not grooved nor hollowed, rugose or punctate ; pericarp very delicate, irregularly breaking away ; hilum basal, punctiform ; embryo scarcely equalling $\frac{1}{2}$ the length of the grain.

Annuals or perennials; leaf-blade flat, sub-flaccid; ligule membranous, short; inflorescence an umbel of 2-6 erect or stellately spreading spikes; rhachis flattened, bearing the densely imbricate 2-seriate spikelets on one side, produced beyond the spikelets into a barren mucroniform usually curved portion.

Species 3 or 4, widely distributed: 1 species in South Africa, extending from the Transvaal and Natal to the coastal districts of the Cape Province.

399a

90. LOPHACHME, Stapf

Spikelets solitary, sub-sessile, laterally compressed, not falling entire; rhachilla slender, glabrous, disarticulating above the glumes and between the two lowest valves, tough above. *Flowers* 2, bisexual. *Glumes* persistent, unequal, narrow, membranous, 1-nerved, keeled. *Valves* about 6; the lowest 2 subtending the flowers, shorter than the glumes; the following gradually reduced, embracing each other and forming a tuft of awns; fertile valves membranous, linear-lanceolate in profile, 2-toothed, 3-nerved, with the side nerves evanescent above, finely awned from between the teeth; callus minutely hairy; barren valves entire, passing into fine awns, without a callus, glabrous. *Pales* very narrow, 2-keeled, slightly shorter than the valves. *Lodicules* 2, very minute, cuncate, hyaline. *Stamens* 3. *Ovary* glabrous; styles distinct, short; stigmas loosely plumose, laterally exserted. *Grain* unknown.

Perennial; leaf-blade flat; ligule a ciliate rim; inflorescence a sub-digitate panicle of very slender somewhat flexuous spike-like racemes.

Endemic; species 1, recorded from the Transvaal.

399b

91. CROSSOTROPIS, Stapf

Spikelets solitary, sub-sessile, laterally compressed, not falling entire; rhachilla slender, disarticulating above the glumes and between the valves. *Flowers* 3-9, bisexual, or the uppermost sometimes male. *Glumes* persistent, sub-equal or equal, membranous, narrow, acuminate, strongly 1-nerved, keeled. *Valves* 3-9, equalling the glumes, or slightly exserted, or overtopped by the awn-like tips of the glumes, somewhat distant, membranous, linear-oblong in outline, shortly 2-lobed, mucronate or shortly awned from the sinus, 3-nerved, with the side nerves sub-marginal, sub-percurrent, rigidly ciliate, with inflexed margins; callus small, hairy. *Pales* narrow, 2-keeled, slightly shorter than the valves. *Lodicules* 2, cuneate, small. *Stamens* 3. *Ovary* glabrous; styles distinct, very slender; stigmas plumose, laterally exserted. *Grain* oblong in outline, strongly compressed from the back, concave or flat, enclosed by the slightly altered valve and pale; hilum basal, punctiform; embryo about $\frac{1}{2}$ the length of the grain.

Annuals or perennials; leaf-blade usually flat; ligule hyaline; inflorescence a contracted and narrow or open panicle; panicle when open, with the branches spreading at right angles; rhachis rigid, bearing the more or less distinctly 2-ranked spikelets.

An African genus of 3 species; 1 species in South Africa, extending from the Transvaal into Natal, Bechuanaland, Griqualand West, and the central districts.

310

92. ENNEAPOGON, Desv.

Spikelets solitary, peduncled, not falling entire; rhachilla disarticulating above the glumes, minutely scaberulous or almost smooth. *Flowers* 1-2; the lower bisexual; the upper, when present, male. *Glumes* persistent, membranous, acute, obtuse, or minutely truncate, 3-5- or sub-7-nerved. *Valves* 3; uppermost reduced to a tuft of minute awns; middle valve about $\frac{1}{2}$ as long as the lowest, glabrous, sometimes subtending a male flower,

with a rudimentary or suppressed ovary; lowest subtending a bisexual flower, rather firm, very broad, rounded on the back, 9-nerved, 9-awned, more or less villous; awns subulate, equal or sub-equal, plumose, ciliate or scaberulous; callus minute, short. *Pale* oblong, 2-keeled, exceeding its valve. *Lodicules* 2, minute, cuneate, fleshy. *Stamens* 3. *Ovary* glabrous; styles distinct, short; stigmas laterally exerted, loosely plumose. *Grain* oblong in outline, dorsally more or less compressed; hilum sub-basal, punctiform; embryo large.

Perennials, rarely sub-annuals; leaf-blade usually narrow, often convolute; ligule reduced to a line of hairs; inflorescence a contracted more or less spike-like panicle, bristly-plumose from the numerous awns.

Species about 7, natives of the warm dry regions of the Old World; 5 species in South Africa, with a fairly wide distribution.

312

93. SCHMIDTIA, Steud.

Spikelets solitary, peduncled, turgid, many-bristled, not falling entire; rhachilla disarticulating above the glumes and between the valves, with the internodes extremely short, glabrous. *Flowers* 3-8, bisexual. *Glumes* persistent, membranous, acute or sub-obtuse, 9-11-nerved. *Valves* 4-9; the uppermost not subtending a flower; remainder rather firm below, thin above, broad, rounded on the back, 4-lobed, 9-nerved, with 5 of the nerves excurrent into straight subulate scabrid awns and the 4 alternate ones precurrent almost to the tips of the lobes; callus slender, minute, bearded. *Pales* oblong, 2-keeled, rather longer than the body of the valves. *Lodicules* 2, minute, cuneate, fleshy. *Stamens* 3. *Ovary* glabrous; styles distinct, slender; stigmas laterally exerted, loosely plumose. *Grain* oblong in outline, dorsally compressed; hilum sub-basal, punctiform; embryo large.

Perennials or annuals, more or less glandular-pubescent; leaf-blade rather rigid, flat or convolute; ligule a line of hairs; inflorescence a contracted narrow oblong or linear panicle.

An African genus of 3-4 species; 1 species in South Africa, extending from the Transvaal to Bechuanaland, Griqualand West, and Namaqualand.

317

94. TRIRAPHIS, R.Br.

Spikelets solitary, peduncled, laterally compressed, not falling entire; rhachilla disarticulating above the glumes and between the valves. *Flowers* usually several, bisexual. *Glumes* thin, sub-equal, lanceolate to linear-lanceolate, sometimes truncate, sometimes minutely 2-toothed and aristulate, sometimes acuminate, 1-nerved, keeled. *Valves* 5-18, thin, oblong, 3-lobed, 3-nerved, 3-awned, with the middle lobe more or less bifid and awned from the sinus, with the side lobes shorter entire asymmetric and awned from the inner side, with inflexed margins, and with the nerves, particularly the lateral, ciliate; awns fine, scabrid, often longer than the valves; callus slender, acute, bearded. *Pales* linear or linear-oblong, somewhat shorter than the valves. *Lodicules* 2, cuneate, delicate, minute. *Stamens* 3. *Ovary* glabrous; styles distinct, slender; stigmas laterally exerted, very slender, plumose. *Grain* tightly embraced by the scarcely changed valve and pale, linear in outline, terete or obtusely triquetrous; hilum basal, punctiform; embryo short.

Annuals or perennials; leaf-blade narrow, linear; ligule a ciliated membranous rim; inflorescence a contracted spike-like or open panicle.

Species 9-10, natives of Africa and Australia; about 7 species in South Africa, extending from the Transvaal into the O.F.S., Griqualand West, Bechuanaland, Namaqualand, and to the south-western districts.

323

95. UROCHLÆNA, Nees

Spikelets solitary, sessile or sub-sessile, oblong to obovate in outline, slightly laterally compressed, hispid, not falling entire; spikelets at the base of the lower branches sometimes with a single flower, or sometimes barren and consisting of 2-4 empty glumes; rhachilla tough. *Flowers* 1 to few, bisexual. *Glumes* sub-equal, membranous, ovate-oblong, rounded on the back, rigidly aristate-acuminate, 5-nerved. *Valves* 1-7, similar, 7-nerved, with the side nerves conniving below the tip; awns shorter than those of the glumes; the upper valves not subtending flowers. *Pales* linear-oblong, almost equalling the valves (exclusive of the awns), 2-keeled. *Lodicules* minute, 2, cuneate, emarginate. *Stamens* 3. *Ovary* glabrous; styles distinct, very short; stigmas very slender, delicately plumose, laterally exserted. *Grain* enclosed by the little altered valve and pale, free, oblong in outline, dorsally compressed, convex on the back, obscurely concave in front; hilum basal, elliptic, minute; embryo elliptic, equalling about $\frac{1}{2}$ the length of the grain.

Dwarf glabrous annuals, much branched from the base; leaf-blade narrow; ligule ciliate; inflorescence of very short spike-like or capituliform panicles; panicles ovoid, small, embraced at the base by the uppermost sheath and deciduous with it, terminal, rarely with an additional somewhat remote peduncled cluster of spikelets below it; branches very short, 4-1-spiculate.

Endemic; species 2, found in the south-western districts and Namaqualand

326

96. FINGERHUTHIA, Nees

Spikelets solitary, peduncled, strongly laterally compressed, falling entire; the lowermost spikelets barren and consisting of a few empty glumes; rhachilla tough. *Flower* usually 1, sometimes a second male flower present. *Glumes* sub-equal, thin, narrow, complicate, 1-nerved, keeled, shortly awned or mucronate. *Valves* 1-3, rather firm, oblong to lanceolate, mucronate, 7-5 (rarely 3-) nerved; the upper or uppermost smaller, or sometimes very rudimentary. *Pales* slightly shorter than their valves, ovate-oblong, 2-keeled, with broad flaps. *Lodicules* 2, cuneate. *Stamens* 3. *Ovary* glabrous, slightly constricted below the apex; styles distinct, rather long; stigmas very slender, finely plumose, sub-terminally exserted. *Grain* ovate in outline; pericarp thin, hyaline; hilum small, sub-basal; embryo large, about $\frac{3}{4}$ the length of the grain.

Perennials, caespitose; innovation shoots intravaginal; leaf-blade narrowly linear; ligule a line of dense silky hairs; inflorescence a compact spike-like panicle.

Endemic; species 2, with a wide distribution.

331

97. ARUNDO, Linn.

Spikelets solitary, peduncled, not falling entire; rhachilla disarticulating above the glumes and between the valves, glabrous or minutely pubescent. *Flowers* bisexual. *Glumes* equal or sub-equal, narrow, acute, sometimes acuminate, 3-nerved, keeled, glabrous. *Valves* 2-7, broader than the glumes, entire or finely bifid and with a short mucro from the sinus, 5-9-nerved, hairy from the back; the lower subtending bisexual flowers; the upper usually empty. *Pales* shorter than the valves, 2-keeled, hyaline. *Lodicules* 2. *Stamens* 3. *Styles* distinct, rather long; stigmas plumose. *Grain* oblong in outline, free, enclosed by the valve and pale, glabrous; hilum basal, punctiform; embryo large.

Perennial; rhizomes creeping; culm tall, stout, woody; leaf-blade flat; ligule very short, membranous; inflorescence a large contracted or effuse panicle;

Species 1, native of the Mediterranean Region, Madagascar, and India ; introduced into South Africa and found in the coastal districts of the Cape Province and in the northern Transvaal.

333

98. PHRAGMITES, Trin. (partly).

Spikelets solitary, peduncled, long-silky, not falling entire ; rhachilla disarticulating above the first and between the following valves, slender, glabrous, with very short internodes. *Flowers* 1 or more, bisexual, sometimes a male flower below the bisexual. *Glumes* thin, unequal to sub-equal, lanceolate, more or less rounded on the back, acute, 3-nerved, or the lower sometimes sub-5-nerved. *Valves* 3-10, heteromorphous ; lowest much longer than the subtending glume, persistent, linear-lanceolate, glabrous, otherwise similar to the glume, sometimes subtending a male flower ; following valves subtending bisexual flowers or the uppermost empty, very thin, linear, long and more or less caudate-acuminate, 3-5-nerved, with the middle nerve percurrent and the side nerves fine and short ; callus long, slender, silky with very long hairs. *Pales* about $\frac{1}{2}$ as long as the valves, linear-oblong, 2-keeled. *Lodicules* 2, sometimes 3 in the lowest male flower (when present) obovate, 2-3-nerved. *Stamens* 3, or 2 in the lowest male flower when present. *Ovary* glabrous ; in the lowest male flower when present, rudimentary or quite suppressed ; styles distinct, rather short ; stigmas laterally exerted, densely plumose. *Grain* loosely enclosed by the valve and pale, free, oblong in outline, semi-terete ; hilum short, basal, oblong ; embryo about $\frac{1}{2}$ as long as the grain.

Perennial ; rhizomes creeping ; innovation shoots extravaginal ; culm tall, sheathed, annual or perennial ; leaf-blade flat ; ligule a narrow ciliated membranous rim ; inflorescence a lax usually very large and much compound panicle.

Species 1, native of the the temperate and sub-tropical regions of both hemispheres ; extending in South Africa from the Transvaal into Natal, Basutoland, the O.F.S., Griqualand West, Bechuanaland ; also in the central and coastal districts of the Cape Province.

337

99. DIPLACHNE, Beauv.

Spikelets solitary, shortly peduncled or almost sessile, light or olive green in colour and often tinged with purple and dark, not falling entire ; rhachilla disarticulating above the glumes and between the valves, glabrous. *Flowers* bisexual. *Glumes* persistent, unequal or sub-equal, membranous, 1-nerved, keeled. *Valves* 2-10, membranous, oblong to linear-oblong, 2-toothed or minutely notched, sometimes 2-cleft, rarely quite entire, mucous, or mucronulate from the sinus, very rarely shortly awned from below the apex, 3-nerved, usually finely ciliate on the lower part of the nerves or sometimes glabrous ; side-nerves percurrent or sometimes very shortly excurrent ; the lower usually subtending the flowers ; the uppermost sometimes empty. *Pales* 2-keeled, shorter than the valves. *Lodicules* 2, cuneate, fleshy, nerved. *Stamens* 3. *Ovary* glabrous ; styles distinct, slender ; stigmas plumose, laterally exerted. *Grain* enclosed by the slightly altered valve and pale, oblong or obovate in outline, dorsally compressed, sometimes quite flat, rarely terete ; hilum basal, punctiform ; embryo equalling $\frac{1}{3}$ - $\frac{1}{2}$ the length of the grain.

Mostly perennials, tufted, somewhat coarse ; leaf-blade long, narrow, flat or involute ; ligule membranous, sometimes reduced to a rim ; inflorescence a panicle, consisting of slender usually long simple loosely spike-like and more or less distant branches.

Species about 12, natives of the warmer regions of the Old World and America ; 3 species in South Africa, with a wide distribution.

337a

100. POGONARTHRIA, Stapf

Spikelets solitary, sub-sessile, laterally compressed, livid, purplish, or dark grey in colour, not falling entire; rhachilla disarticulating above the glumes and between the valves, with the tips of the internodes ciliated. *Flowers* 2-11, bisexual. *Glumes* rigidly membranous, 1-nerved. *Valves* 2-11, rigidly membranous, acuminate, 3-nerved, with the side nerves evanescent above the middle, glabrous. *Pales* slightly shorter than the valves, 2-keeled. *Lodicules* 2, minute, delicate. *Stamens* 3. *Ovary* glabrous; styles distinct; stigmas plumose. *Grain* tightly embraced by the scarcely altered valve and pale, linear-oblong in outline, obtusely triquetrous or oval in cross-section; hilum basal, punctiform; embryo less than $\frac{1}{2}$ the length of the grain.

Stiff perennial; leaf-blade rigid, usually convolute; ligule a fringe of cilia; inflorescence a panicle, with the spikelets more or less imbricate and secund on the irregularly spirally arranged branches.

Endemic; species 1, found in the Transvaal, Natal, O.F.S., Griqualand West, and Bechuanaland.

337b

101. LEPTOCARYDION, Hochst.

Spikelets solitary, sessile or sub-sessile, laterally compressed, not falling entire; rhachilla disarticulating above the glumes and between the valves. *Flowers* bisexual. *Glumes* sub-equal, lanceolate, acuminate, 1-nerved, keeled. *Valves* 4-9, thin, oblong, truncate, minutely 4-toothed, with hyaline teeth, with inflexed margins, 3-nerved, with the nerves ciliate and the middle nerve only excurrent into a fine bristle; the uppermost without flowers; callus slender, acute, bearded. *Pales* slightly shorter than the valves, linear-oblong, 2-keeled. *Lodicules* 2, cuneate, delicate. *Stamens* 3; anthers minute. *Ovary* glabrous; styles distinct, slender; stigmas very slender, plumose, laterally exserted. *Grain* linear in outline, obtusely triquetrous, tightly embraced by the scarcely changed valve and pale, free; hilum basal, punctiform; embryo less than $\frac{1}{2}$ length of the grain.

Annuals; culm tufted, many-noded; leaf-blade linear to oblong-lanceolate; ligule hyaline, very short or obscure; inflorescence a dense spike-like panicle; branches erect, simple or with adpressed branchlets, with the spikelets close, secund, and in 2 rows.

Endemic; species 3, recorded from Natal.

341

102. ERAGROSTIS, Beauv.

Spikelets solitary, peduncled, rarely sessile, usually strongly laterally compressed, not or rarely falling entire; rhachilla disarticulating above the glumes and between the valves, or tough and persistent, occasionally disarticulating below the glumes, glabrous, sometimes more or less scaberulous, very rarely minutely hairy. *Flowers* bisexual. *Glumes* persistent or deciduous, equal or unequal, usually membranous, 1-nerved or the upper sometimes 3-nerved, keeled. *Valves* 2 to many, membranous to chartaceous, more or less imbricate, ovate to lanceolate to almost orbicular, acute or obtuse, entire, muticous, 3-nerved, with the side-nerves short or almost percurrent, glabrous, very rarely minutely pubescent; the uppermost without flowers. *Pales* equal to the valves or slightly shorter, membranous, 2-keeled, deciduous or persistent on the rhachilla. *Lodicules* 2, small, cuneate, more or less fleshy. *Stamens* 3, rarely 2. *Ovary* glabrous; styles distinct; stigmas plumose, laterally exserted. *Grain* enclosed by the scarcely altered valve and pale and deciduous with them, or more commonly falling with the deciduous valve, leaving the more or less persistent pale behind, oblong, ovate or round in outline, terete, or very obtusely triquetrous or quadrangular in cross-section; pericarp thin, sometimes slightly swelling

or separating ; hilum basal, punctiform ; embryo often $\frac{1}{2}$ as long as the grain, sometimes longer.

Perennials or annuals of varying habit ; leaf-blade narrow ; ligule reduced to a fringe of usually minute hairs, very rarely membranous ; inflorescence a lax effuse contracted or spike-like panicle, or transformed into simple or compound spikes.

Species very numerous, in the warm parts of the world ; about 50 species in South Africa, widely distributed.

346

103. KÆLERIA, Pers.

Spikelets solitary, peduncled, laterally compressed, not falling entire ; rhachilla disarticulating above the glumes and between the valves, produced, with or without a terminal rudimentary valve, glabrous or finely hairy. *Flowers* 1 or more, all bisexual. *Glumes* persistent, equal or unequal, sub-acute, sometimes acuminate, with hyaline margins ; lower usually 1-nerved, occasionally 3-nerved ; upper 3-nerved. *Valves* 1-5, exceeding the glumes, acute or obtuse, with the margins and tips broadly hyaline, 3-5-nerved, with the side-nerves usually faint and conniving above and the middle nerve percurrent or excurrent into a mucro or a short sub-terminal awn ; uppermost valves, when present, usually without flowers ; callus very minute, glabrous. *Pales* shorter than the valves or almost as long, 2-keeled, 2-toothed, conspicuously hyaline and white. *Lodicules* 2, hyaline. *Stamens* 3. *Ovary* glabrous ; styles distinct, very short ; stigmas laterally exerted, plumose. *Grain* oblong in outline, laterally compressed, whitish, soft, tightly embraced by the hardened back of the valve ; hilum basal, short, obscure ; embryo small.

Perennials or annuals ; leaf-blade usually very narrow ; ligule hyaline ; inflorescence usually a cylindric often interrupted panicle, glabrous and glistening from hyaline white margins of the valves and pales, or more or less hairy.

Species numerous, mainly in Europe, north Africa, and temperate Asia ; 2 species in South Africa, generally distributed.

355

104. MELICA, Linn.

Spikelets solitary, peduncled, more or less scarious, often vividly coloured, nodding, laterally or dorsally compressed or sub-terete, jointed (sometimes imperfectly) on their peduncles or continuous with them ; peduncles capillary, with usually strongly incurved tips ; rhachilla tardily disarticulating above the glumes, readily between the fertile valves. *Flowers* 1-2, rarely 3, bisexual. *Glumes* membranous, hyaline or scarious, obtuse or acute, 3-5-nerved, or the upper 7-nerved. *Valves* 3-5 ; lower 1-2, rarely 3, subtending bisexual flowers ; following 2-3, barren, small, embracing each other and forming a clavate or oblong body ; fertile valves firmly membranous except at the hyaline margins and tips, often long or shortly hairy, awnless, 7-9-nerved, with the nerves evanescent below the tips ; callus minute, obtuse. *Pales* shorter than the valves, 2-keeled. *Lodicules* 2, small, truncate, quite connate. *Stamens* 3. *Ovary* glabrous ; styles distinct, short ; stigmas laterally exerted, finely plumose. *Grain* enclosed by the more or less hardened (chartaceous) valve and the pale, free, oblong, semi-terete ; hilum a fine line as long as the grain ; embryo small.

Perennials ; leaf-blade flat or convolute ; ligule hyaline, inflorescence an open or spike-like panicle, or almost reduced to a raceme, many to few-spiculate, often secund.

Species about 40, natives of most temperate countries ; 6 species in South Africa, recorded from Natal, Basutoland, the O.F.S., and the central and coastal districts of the Cape Province.

367

105. BRIZA, Linn.

Spikelets solitary, peduncled, laterally compressed, sometimes nodding, not falling entire; rhachilla disarticulating above the glumes and between the valves; peduncles sometimes capillary. *Flowers* many, bisexual. *Glumes* persistent, sub-equal, scarious or firmly membranous, boat-shaped, or saccate with the back rounded, sometimes keeled, 3- to sub-7-nerved. *Valves* close, firmly membranous, with scarious margins or almost wholly scarious, boat-shaped, or saccate with the back rounded, sometimes keeled, obtuse, acute, sub-acuminate or sub-aristate, 7-9-nerved, with the outer 3 or all the side nerves spreading from a common base, rarely 5-nerved, with the side-nerves distant at the base; the lower subtending the flowers; the upper usually empty. *Pales* broad, shorter than the valves, 2-keeled; keels often winged. *Lodicules* 2, obliquely-ovate, hyaline, fleshy at the base. *Stamens* 3. *Ovary* glabrous; styles short, distinct; stigmas very slender, loosely plumose, laterally exerted. *Grain* tightly embraced by the hardened back of the valve and the pale, usually adherent to the latter, concavo-convex to plano-convex, usually dorsally compressed; hilum basal, small, elliptic, oblong or linear; embryo small.

Annuals or perennials; leaf-blade flat and rather broad, or convolute and narrow; ligule hyaline; inflorescence an effuse panicle with capillary branchlets and peduncles and nodding spikelets, sometimes reduced to a raceme, contracted or almost spiciform.

Species about 11, natives of the Mediterranean Region and South America; 2 species in South Africa (both introduced), mainly in the south-western districts.

368

106. DEMAZERIA, Dumort

(Brizopyrum, Nees)

Spikelets solitary, sub-sessile, more or less laterally compressed, not falling entire; rhachilla tardily disarticulating above the glumes and between the valves. *Flowers* several, bisexual. *Glumes* shorter than the valves, firmly membranous or sub-coriaceous except at the scarious margins, mucronulate, 4-7-nerved, keeled, glabrous, or hispid from tubercle-based hairs; lower often somewhat asymmetric. *Valves* 4-10, firmly membranous or sub-coriaceous, navicular, obtuse or mucronulate, 7-nerved, with the lateral nerves conniving above and evanescent below, or altogether invisible except by transmitted light, minutely villous above the base, or with 2-3 short lines of clavate or acute hairs, rarely glabrous; the lower subtending flowers; the upper barren; callus obscure, glabrous. *Pales* shorter than the valves, 2-keeled; keels sometimes narrowly winged. *Lodicules* 2, truncate, acuminate, nerved, ciliate, sometimes papillose. *Stamens* 3. *Ovary* obovoid, obtuse, glabrous; styles distinct, very short; stigmas laterally exerted, plumose. *Grain* enclosed by the scarcely changed valve and pale, free, oblong in outline, semi-terete; hilum basal, minute; embryo small.

Perennials or annuals; innovation shoots intravaginal; leaf-blade flaccid, or rigid and convolute; ligule a hairy or ciliate rim; inflorescence a spike-like panicle, or partly or wholly transformed into dense 2-ranked spikes.

Species 6, natives of Africa and St. Helena; 5 species in South Africa, extending from the south-western districts to Namaqualand.

371

107. LASIOCHLOA, Kunth

Spikelets solitary, peduncled, mostly hispid from tubercle-based hairs, not falling entire; rhachilla very short, disarticulating above the glumes and

between the valves. *Flowers* 1-3, bisexual or the uppermost sometimes male. *Glumes* equal or sub-equal, usually asymmetric, firmly membranous, acute, sometimes acuminate or subulate-caudate, with hyaline margins, 5-nerved, sometimes bristly or hispid. *Valves* 2-4, navicular, firmly membranous, with thin margins and tips, obtuse or acute, mucronulate, 7-9-nerved, with the side nerves conniving above and evanescent below, with a sub-marginal line of acute hairs on each side; the lower subtending a bisexual flower; the uppermost empty or subtending a male flower; callus obscure, glabrous. *Pales* shorter than the valves, 2-keeled. *Lodicules* 2, truncate, cuneate, scantily ciliated from articulated hairs. *Stamens* 3. *Ovary* glabrous; styles short, distinct; stigmas laterally exerted, plumose. *Grain* free, enclosed by the unchanged valve and pale, oblong in outline, dorsally compressed, hilum basal, minute; embryo small.

Perennials or annuals; leaf-blade flaccid, or rigid and convolute; ligule a rim of hairs; inflorescence a dense spike-like often lobed panicle.

Endemic; species 3 or 4, found in the south-western districts and Little Namaqualand.

371a

108. STIBURUS, Stapf

Spikelets solitary, sub-sessile or shortly peduncled, laterally compressed, usually dark-purple in colour, greyish-villous, not falling entire; rhachilla disarticulating above the glumes and between the valves, very minutely produced. *Flowers* 1-4, bisexual. *Glumes* equal or sub-equal, membranous, lanceolate, caudate-acuminate, 1-nerved. *Valves* 2-5, very similar to the glumes and shortly exerted from them but 3-nerved; the upper or uppermost barren; callus very minute. *Pales* shorter than the valves, 2-keeled. *Lodicules* 2, minute, hyaline, cuneate. *Stamens* 3. *Ovary* glabrous; styles short, distinct; stigmas plumose, laterally exerted. *Grain* enclosed by the hardly changed valve and pale, free, oblong in outline, terete; pericarp delicately hyaline, free, swelling slightly in water; hilum basal, punctiform; embryo short.

Tufted perennials; leaf-blade very narrow, usually sub-setaceous, long; ligule a ciliated rim; inflorescence a dense cylindric panicle.

Species 1, African; recorded in South Africa from the Transvaal, Natal, O.F.S., East Griqualand, and Pondoland.

372

109. DACTYLIS, Linn.

Spikelets in dense secund shortly peduncled fascicles, not falling entire; rhachilla tough or tardily disarticulating between the valves. *Flowers* 3-7, sometimes 2-6, bisexual. *Glumes* rigid, membranous, sub-equal or the lower shorter, keeled, mucronate, 1-3-nerved. *Valves* 3-7, exceeding the glumes, rigid, 5-nerved, keeled, with the keel ciliolate and produced into a mucro or short awn; the uppermost valve sometimes barren. *Pales* very little shorter than the valves, 2-keeled. *Stamens* 3. *Ovary* glabrous; styles distinct; stigmas plumose. *Grain* compressed from the back, concave or broadly sulcate on the face, free and enclosed by the valve and pale.

Somewhat tall perennials; leaf-blade flat; ligule scarious; inflorescence a crowded panicle or false spike.

Species 1, native of the temperate regions of the Old World; in South Africa recorded from the south-western districts and the O.F.S.

373

110. CYNOSURUS, Linn.

Spikelets dimorphic, peduncled or sub-sessile; the sterile usually surrounding the fertile. *Fertile spikelets*: *Rhachilla* readily disarticulating, with short

internodes. *Flowers* 1-6, sometimes 2-7, bisexual. *Glumes* equal or sub-equal, almost the length of the spikelets, subulate to lanceolate, 1-nerved, with the nerve excurrent in a mucro or short awn. *Valves* 2-7, membranous, oblong to lanceolate in profile, rounded on the back, minutely or obscurely 2-toothed, mucronate or awned from close below the tip, 5-nerved; the uppermost sometimes without a flower; callus small, obtuse, glabrous. *Pales* sub-equal to the valves, 2-keeled, 2-toothed. *Lodicules* 2, small, oblong. *Stamens* 3. *Ovary* glabrous; styles distinct, short; stigmas loosely plumose, laterally exserted. *Grain* oblong in outline, grooved in front, more or less adhering to the valve and pale; hilum linear, short; embryo small. *Sterile spikelets* consisting of 2 glumes more or less similar to those of the fertile spikelets and a number of bracts arranged on a tough elongated rhachilla; the lower bracts rather narrow and spreading; the upper bracts broader and more closely imbricating; all or at least the lower bracts passing into bristle-like awns.

Annuals or perennials; leaf-blade flat, more or less flaccid; ligule hyaline; inflorescence usually a dense panicle, often appearing unilateral by the contortion of all the branches to one side.

Species 3 or 4, natives of Europe, western Asia, and northern Africa; recorded in South Africa from the Cape Peninsula.

374

111. LAMARCKIA, Mœnch.

Spikelets dimorphic, peduncled, or sub-sessile; the fertile hidden by the sterile. *Fertile spikelets*: *Rhachilla* tough, not disarticulating, continued and terminating in a much reduced awned valve. *Flowers* 1-2, bisexual or sometimes 1 male. *Glumes* sub-equal, equalling the spikelet, keeled, narrow, finely acuminate. *Valves* 2, inserted about 1 mm. above the glumes, and broader than them, oval-oblong, rounded on the back, dorsally awned from below the 2-fid tip; the upper sometimes barren or subtending a male flower; awn fine, straight, scabrid, 2-3 times longer than the valve. *Pale* narrow, 2-keeled. *Lodicules* 2, minute, nerveless, delicate. *Stamens* 3. *Styles* short, distinct; stigmas slender, barbellate. *Grain* elliptic-oblong in outline, slightly compressed, free, enclosed in the unaltered valve and pale. *Sterile spikelets* oblong-linear, consisting of 2 narrow acutely acuminate glumes and valves; valves many, short, broad, mucous, truncate or emarginate, finely or irregularly toothed, distichously imbricate.

A tufted low-growing annual; leaf-blade flat and thin; ligule thinly membranous, somewhat elongated; inflorescence a dense contracted and usually pendulous panicle with short branches; panicle usually appearing unilateral.

Species 1, native of the Mediterranean Region; recorded in South Africa from the Cape division.

376

112. SCHISMUS, Beauv.

Spikelets solitary, peduncled, laterally compressed, conspicuously nerved, not falling entire; rhachilla disarticulating somewhat tardily above the glumes and readily between the valves, slender, glabrous. *Flowers* 3-8, bisexual. *Glumes* much longer than the single valves, sub-equal, acute, herbaceous on the back, usually with white sub-hyaline margins; the lower broader, 5-7-nerved; the upper 3-5-nerved. *Valves* 4-9, exserted from the glumes, obliquely obovate to oblanceolate in profile, 2-lobed or 2-fid, with or without a mucro or a minute awn from the sinus, thin, usually hairy below, rounded on the back, with 7-9 prominent nerves and with

the lateral nerves evanescent and obscurely anastomosing below the hyaline tips ; the uppermost not subtending a flower, callus small. *Pales* spatulate, 2-keeled below the broad top, longer or shorter than the valves. *Lodicules* 2, cuneate, nerved, ciliate. *Stamens* 3. *Ovary* sub-globose, glabrous ; styles distinct, slender, about as long as the narrowly and densely plumose laterally exerted stigmas. *Grain* loosely embraced by the unaltered valve and pale, oblong to obovate in outline, trigonous to plano-convex ; hilum basal, small, elliptic ; embryo less than $\frac{1}{2}$ the length of the grain.

Annuals, very rarely sub-perennials, often small ; leaf-blade very narrow, often sub-setaceous ; ligule reduced to line of hairs ; inflorescence a contracted or at least a narrow panicle.

Species about 4, natives of the Mediterranean Region, India, and Africa ; 3 species in South Africa, found in the central and north-western districts and in Namaqualand ; absent from the east and the Transvaal ; apparently not recorded further east than the Uitenhage district.

378.

113. POA, Linn.

Spikelets solitary, peduncled, awnless, not falling entire ; rhachilla disarticulating above the glumes and between the valves, glabrous or scantily and minutely hairy. *Flowers* usually 2-6, bisexual. *Glumes* thin, membranous, acute or obtuse, keeled, 1-3-nerved. *Valves* 2-6, membranous, sometimes rather firm, obtuse or acute, 5-7-nerved ; the upper or uppermost sometimes without a flower ; callus small, obtuse, often with a tuft of long wool. *Pales* shorter than the valves, 2-keeled. *Lodicules* 2, more or less 2-lobed. *Stamens* 3. *Ovary* glabrous ; styles short, free ; stigmas plumose, laterally exerted. *Grain* ovate, oblong, or linear in outline, often grooved, free or adherent to the pale ; hilum basal, punctiform ; embryo small.

Annuals or perennials ; leaf-blade flat and flaccid, or convolute and more or less rigid ; ligule hyaline ; inflorescence an open often effuse panicle, rarely a contracted spike-like panicle.

Species numerous, natives of the temperate regions of both hemispheres ; 6-7 species in South Africa, with a fairly wide distribution.

384

114. ATROPIS, Griseb.

Spikelets solitary, peduncled, narrow, laterally compressed or sub-cylindric, close, not falling entire ; rhachilla disarticulating above the glumes and between the valves, glabrous, produced. *Flowers* 2-3 to many. *Glumes* unequal, broad, obtuse, rounded on the back, 1-3-nerved. *Valves* 2 to many, exerted from the glumes, rather firm below the hyaline tips, oblong, obtuse, rounded on the back, 5-nerved, with the nerves usually obscure except in transmitted light ; callus minute. *Pales* almost as long as the valves, 2-keeled. *Lodicules* 2, ovate, hyaline. *Stamens* 3. *Ovary* glabrous ; styles very short, distinct ; stigmas laterally exerted, delicately plumose. *Grain* tightly embraced by the hardened valve and pale, oblong in outline, almost semi-terete, sub-concave in front ; hilum basal, punctiform ; embryo small.

Perennials ; leaf-blade linear, flat, plicate or convolute ; ligule hyaline ; inflorescence an open or contracted panicle ; branches usually spreading, often naked for a considerable distance ; branchlets and peduncles adpressed.

Species about 12, mostly natives of the temperate regions of the northern hemisphere ; 2 species in South Africa, recorded from Namaqualand and the south-western districts.

385

115. FESTUCA, Linn.

Spikelets solitary, long-peduncled, laterally compressed, not falling entire; rachilla disarticulating above the glumes and between the valves. *Flowers* 2 to many, bisexual. *Glumes* persistent, unequal to sub-equal, acute, keeled, 1-nerved; upper usually 3-5-nerved. *Valves* 2 to many, narrow-lanceolate, acute or obtuse, mucicous, mucronate, or with an awn from the tip or just below it, rounded on the back or somewhat keeled above, 5-7-nerved; the uppermost sometimes without a flower. *Pales* slightly shorter than the valves, 2-keeled. *Lodicules* 2, hyaline, unequally lobed or entire. *Ovary* glabrous or minutely hairy at the apex; styles short, distinct; stigmas plumose, laterally exserted. *Grain* oblong or linear-oblong in outline, glabrous, grooved or concave in front, tightly enclosed by the slightly hardened valve and pale and partially adhering to them, or quite free; hilum long, linear; embryo small.

Mostly tufted perennials, low growing or tall; leaf-blade flat, or convolute, or sometimes setaceous; ligule scarious; inflorescence a lax or contracted or sometimes a large and effuse panicle.

Species many, mostly natives of the temperate regions of both hemispheres; 5-6 species in South Africa recorded from the coastal and central regions of the Cape Province, Natal, and the O.F.S.

385a

116. VULPIA, Gmel.

Spikelets solitary, peduncled, sub-cylindric and acuminate when young, laterally compressed and broader upwards after flowering, not falling entire; peduncles short, clavate; rachilla slender, disarticulating above the glumes and between the fertile valves. *Flowers* bisexual, often cleistogamous. *Glumes* very unequal; lower shorter than the upper, very minute, or obsolete, or subulate to subulate-lanceolate, 1-nerved; upper subulate to subulate-lanceolate, 3-nerved. *Valves* 5-7, much exserted from the glumes, subulate-lanceolate, passing into an awn, rounded on the back, faintly 5-nerved; the upper without flowers; awn straight, often long; callus small, obtuse, glabrous. *Pales* 2-keeled, entire or minutely 2-toothed. *Lodicules* 2, hyaline, unequally lobed. *Stamens* 1-3; filaments very short; anthers usually enclosed between the valve and pale during flowering or permanently. *Ovary* glabrous or minutely hispid at the top; stigmas sessile, plumose, permanently enclosed between the valve and pale or shortly exserted at the base. *Grain* linear in outline, strongly compressed from the back, concave in front, more or less adhering to the pale; hilum filiform, long; embryo small.

Slender annuals or perennials; leaf blade linear, very narrow, usually convolute or involute at least when dry; ligule membranous; inflorescence a contracted narrow usually a more or less secund panicle.

Species about 20, mostly natives of the Mediterranean Region and adjacent countries; 2 species found in South Africa as introductions.

388

117. SCLEROPOA, Griseb.

Spikelets awnless, solitary, peduncled, narrow, laterally compressed, or almost cylindric when closed, not falling entire; rachilla very tardily disarticulating above the glumes and between the valves. *Flowers* few to many, bisexual. *Glumes* persistent, more or less unequal, herbaceous, oblong, acute or obtuse, 1-3-nerved, stoutly keeled. *Valves* few to many, long exserted from the glumes, firm-herbaceous except at the very tips, oblong, obtuse, rounded on the back or slightly keeled, 5-nerved, with the

outer nerves more distinct than the faint inner; the upper often without flowers; callus obscure. *Pales* almost as long as the valves, 2-keeled. *Lodicules* 2, ovate, hyaline. *Stamens* 3. *Ovary* glabrous; styles distinct, very short; stigmas laterally exserted, plumose. *Grain* very tightly embraced by the hardened valve and pale, oblong in outline, almost semiterete, sub-concave in front, with a small soft terminal cap; hilum basal, punctiform; embryo small.

Dwarf annuals; leaf-blade flat or involute; ligule hyaline; inflorescence a very stiff often rather dense panicle; branches short, 2-ranked, more or less spreading.

Species 3, natives of the Mediterranean Region and extending from the Canary Islands to Persia, also found in western and south-central Europe; 1 species in South Africa, recorded from the Cape Peninsula.

389

118. *BROMUS*, Linn.

Spikelets rather large, erect or pendulous, ovoid to linear-cuneate, laterally compressed at least after flowering, not falling entire; rhachilla disarticulating above the glumes and between the valves. *Flowers* usually many, bisexual. *Glumes* persistent, more or less unequal, acute or sub-obtuse, sometimes acuminate; lower 1-7-nerved; upper 3-9-nerved, sometimes mucronate or aristulate. *Valves* usually many, lanceolate or broadly oblong, often 2-toothed at the apex, rounded or keeled on the back, 5-13-nerved, usually awned; the uppermost without a flower; awn terminal or somewhat distant from the apex, straight or recurved and then often loosely twisted below, not kneed, sometimes reduced to a mucro, or 0. *Pales* entire or bifid; keels usually rigidly ciliolate or ciliate. *Lodicules* 2, oblong or lanceolate, entire or lobed. *Stamens* 3, rarely 2. *Ovary* obovoid, often with a large villous 3- or 2-lobed terminal appendage; styles short, lateral on the appendage; stigmas plumose, laterally exserted, or in the cleistogamic species permanently enclosed. *Grain* linear to linear-oblong in outline, convexo-concave, usually adherent to the valve and pale or at least to the latter; hilum long, filiform; embryo small.

Annuals or perennials of very varying habit; leaf-blade linear, flat, often flaccid; ligule membranous, hyaline; inflorescence a contracted often very dense panicle, or an open and even effuse panicle, or reduced to a raceme.

Species numerous, mostly natives of the temperate regions, many in South America; 11-12 species in South Africa, widely distributed.

393

119. *BRACHYPODIUM*, Beauv.

Spikelets solitary, peduncled, at first cylindric, then laterally compressed with the flattened side towards the axis, not falling entire; rhachilla glabrous, disarticulating above the glumes and between the valves. *Flowers* few to many, bisexual. *Glumes* more or less unequal, firm, strongly 3-7-nerved; lower often slightly asymmetric. *Valves* 5 to many, oblong to oblong-lanceolate, usually narrowed into a straight awn, or mucronate, rounded on the back, at first closely imbricate, then more or less diverging and rolling inwards, 7-nerved, with the nerves prominent in the upper part and faint below; the uppermost usually without a flower; callus very short, obtuse. *Pales* oblong, rather broad, very obtuse or truncate, slightly shorter than the valve, 2-keeled, with the keels rigidly ciliate. *Lodicules* 2, lanceolate, usually ciliolate. *Stamens* 3, rarely 2. *Ovary* with a villous appendage at the top; styles laterally exserted. *Grain* linear or linear-oblong in outline, convexo-concave, adhering more or less to the pale; hilum filiform, long; embryo small.

Perennials or annuals ; leaf-blade flat or setaceous involute ; inflorescence a simple raceme or false spike ; internodes of axis more or less hollowed out (at least the lower) on the side facing the spikelets ; spikelets usually few, sometimes 1, erect or spreading, rather large.

Species about 15, mainly natives of the temperate regions of the northern hemisphere ; 3 species in South Africa, recorded from Namaqualand, the south-western districts, Natal, Basutoland, and the Transvaal.

395

120. *LOLIUM*, Linn.

Spikelets solitary, sessile, usually more or less compressed, 2-ranked, not falling entire ; rachilla glabrous, disarticulating above the glumes and between the valves. *Flowers* few to many, bisexual. *Glumes* of terminal spikelets equal and similar ; lower suppressed in the lateral spikelets ; upper coriaceous, opposite the hollow of the rachis, linear to oblong, obtuse to acute, flat or slightly rounded, prominently 7-9-nerved. *Valves* 3-15, more or less chartaceous except at the short hyaline tips, oblong, rounded on the back, sub-obtuse, minutely 2-toothed, acute when seen in profile, muticous or awned, 5-nerved, glabrous ; the uppermost sometimes without a flower ; awn straight, arising close to the tip. *Pales* equalling the valves or nearly so, 2-keeled, with the keels more or less crested. *Lodicules* 2, lanceolate, with a lateral tooth. *Stamens* 3. *Ovary* truncate, glabrous ; styles distinct, very short ; stigmas laterally exerted, plumose. *Grain* elliptic-oblong to linear-oblong in outline, tightly enclosed by the valve and pale, adhering to both ; hilum linear, almost as long as the grain ; embryo short.

Annuals or perennials ; leaf-blade linear, flat ; ligule hyaline ; inflorescence a terminal spike ; spikelets more or less erect.

Species about 12, natives of the temperate regions of the Old World ; 4 species recorded from South Africa, all introduced.

398

121. *OROPETIUM*, Trin.

Spikelets solitary, sessile, more or less immersed in the hollows of the rachis, not falling entire ; rachilla very slender, glabrous, disarticulating above the glumes. *Flower* 1. *Glumes* of terminal spikelet equal and similar ; lower glume of lateral spikelets suppressed ; upper very narrow, rigid except at the hyaline margins, sub-acute, sometimes acuminate, 1-3-nerved, with the nerves often more or less confluent into a broad rigid midrib. *Valve* shorter than the upper glume, hyaline, oblong or lanceolate in profile, elliptic to broadly oblong when expanded, distinctly or obscurely keeled at least in the upper part, truncate or minutely 3-toothed, 3-nerved, scabrid along the nerves, glabrous ; callus bearded. *Lodicules* 2, minute, cuneate. *Stamens* 3. *Ovary* glabrous ; styles slender, distinct ; stigmas laterally exerted. *Grain* oblong in outline, sub-terete or slightly compressed from the sides ; hilum basal, punctiform ; pericarp membranous ; embryo about $\frac{1}{3}$ the length of the grain ; endosperm rather fleshy.

Dwarf densely tufted perennials, rarely annuals ; leaf-blade setaceous ; ligule short, hyaline, ciliate ; inflorescence a slender straight or gradually curved spike ; rachis tough ; spikelets closely or loosely 2-ranked on the opposite or sub-opposite sides of the rachis.

Species 3, natives of India and Africa ; 1 species in South Africa, found in the Transvaal, Bechuanaland, Griqualand West, and the central districts of the Cape Province.

402.

122. LEPTURUS, R.Br.

Spikelets solitary, sessile, narrow, sunk in hollows of the rhachis, not falling entire; rhachilla very short, produced into a minute point or bearing a rudimentary valve. *Flowers* 1-2, bisexual. *Glumes* persistent, rigid, narrow, acute, 5-nerved; those of the terminal spikelet equal; those of the lateral spikelets equal or the lower much reduced and hyaline, or suppressed. *Valves* 1-2, shorter than the glumes, hyaline, lanceolate to oblong, acute, finely 3-nerved, glabrous; callus obsolete. *Pales* equalling the valves, 2-nerved. *Lodicules* 2. *Stamens* 3. *Ovary* truncate, glabrous; styles distinct, very short; stigmas laterally exserted, plumose. *Grain* narrow-oblong in outline, somewhat dorsally compressed, free, enclosed with the valve and pale between the glume and the rhachis.

Annuals or perennials; leaf-blade flat or involute; ligule short, membranous; inflorescence a slender more or less terete straight or curved spike; rhachis more or less tough or tardily disarticulating.

Species about 6, natives of the coastal regions of the Old World; 1 species in South Africa, recorded from the south-western districts.

405

123. AGROPYRUM, Gærtn.

Spikelets solitary, sessile, more or less laterally compressed, usually long and slender, rigid, rarely stout (in the South African species), with the flattened side towards the hollows in the rhachis, not falling entire; rhachilla disarticulating above the glumes and between the valves, or almost tough. *Flowers* few to many, bisexual. *Glumes* rigid, equal or sub-equal, lanceolate, linear or oblong, usually somewhat asymmetrical, prominently 5 to many-nerved. *Valves* 3 to many, exceeding the glumes, more or less coriaceous, lanceolate to oblong in profile, obtuse and sometimes 3-toothed or mucronate, sometimes acuminate or produced into an awn, 5- (rarely 7-9-) nerved, with the nerves faint or partly evanescent below; the uppermost sometimes without a flower; callus short, very obtuse. *Pales* somewhat shorter than the valves, 2-keeled, with the keels acute or somewhat winged, ciliate. *Lodicules* 2, rather large, oblique or unequally lobed, densely ciliate. *Stamens* 3. *Ovary* obovoid, with a large villous top; styles almost absent; stigmas delicately plumose. *Grain* linear-oblong in outline, plano-convex, tightly enclosed and adhering to the valve and pale or at least to the latter; hilum filiform, as long as the grain.

Perennials, often with long creeping rhizomes; leaf-blade flat or convolute; ligule scarious; inflorescence a simple spike; rhachis tough or disarticulating.

Species 30-35, mainly found in the temperate parts of Europe and Asia; 1 species in South Africa, recorded from the coastal districts of the Cape Province.

407

124. SECALE, Linn.

Spikelets solitary, sessile, laterally compressed, distichously imbricate, falling entire with an internode of the rhachis; rhachilla continued into a short bristle above the base of the upper valve, otherwise scarcely perceptible. *Flowers* 2, bisexual. *Glumes* equal or slightly unequal, very narrow, linear-subulate, strongly compressed, keeled. *Valves* 2, more or less exserted from the glumes, firmly membranous, oblong, lanceolate in profile, strongly compressed, passing into a straight awn, 5-nerved, keeled; callus 0. *Pales* almost as long as the valves, narrow, 2-keeled, 2-toothed. *Lodicules* 2, hyaline, ciliate. *Stamens* 3. *Ovary* obovoid, densely tomentose above; styles distinct, very short; stigmas plumose, laterally exserted. *Grain* oblong in outline, sub-terete, grooved in front, enclosed by the valve and pale, free or almost so; embryo about $\frac{1}{3}$ the length of the grain.

Many described species, natives of the tropical and temperate regions; 4 species in South Africa, recorded from the northern Transvaal and Natal, through the coastal districts, to the Clanwilliam and van Rhynsdorp districts; also found in the Cradock, Albany, Oudtshoorn, and Upington districts. (Type: *S. pennata* L.)

210 74. ORYZOPSIS Michaux, Fl. Bor. Amer., vol. 1, p. 51, pl. 9 (1803)

Spikelets solitary, peduncled, not falling entire. *Flower* 1. *Glumes* persistent, equal or subequal, longer than the valve, usually acute, sometimes sub-acuminate, 3—9-nerved, thin. *Valve* 1, ovate, obovate, or lanceolate, convolute, more or less flattened on the back, obscurely 2-lobed, 5- (very rarely 3-) nerved, sometimes awned, rigidly membranous to coriaceous; awn, when present, from the minute sinus, jointed on the valve and easily deciduous, bristle-like, naked. *Pale* shorter than the valve, 2-nerved. *Lodicules* 2, rarely 3, hyaline. *Stamens* 3. *Ovary* glabrous; styles free, short, plumose, laterally exserted. *Grain* oblong in outline, or ovoid, ellipsoid, or obovoid; embryo small.

Tufted perennials; leaf-blade linear, usually long, flat, flaccid, sometimes narrow and convolute; ligule membranous; inflorescence an open or contracted panicle; primary branches of the inflorescence often in distant semi-whorls.

Species about 24, found mostly in the temperate and subtropical regions of the northern hemisphere; 1—2 species in South Africa, recorded from the Orange Free State, but probably introduced. (Type: *O. asperifolia* Michx.)

216 75. PSEUDOBROMUS K. Schum., in Engl. Pflanzenw. Ost. Afr. C., p. 108 (1895)

Spikelets solitary, peduncled, not falling entire. *Flower* 1. *Glumes* persistent, subequal, ovate, lanceolate, or oblong, acuminate, 1—3-nerved, membranous. *Valve* 1, exserted from the glumes, elliptic-ovate in outline, involute, rounded on the back, passing into a straight awn or with the awn sub-terminal, 3-nerved, membranous; awn more than twice as long as the body of the valve. *Pale* equalling or slightly longer than the valve, lanceolate, 2-keeled. *Lodicules* 2, hyaline, unequally 2-lobed. *Stamens* 3. *Ovary* oblong in outline, pubescent on the top; styles free, very short, plumose above, laterally exserted.

Perennials; leaf-blade flat, broad-linear, flaccid; ligule membranous; inflorescence a large lax nodding panicle.

An African genus of 2 species; 1 species recorded from the northern Transvaal. (Type: *P. silvaticus* K. Schum.)

230 76. SPOROBOLUS R. Br., Prodr. Fl. Nov. Holl., p. 169 (1810)

Spikelets solitary, sessile or peduncled, not falling entire; peduncle usually capillary, swollen at the apex. *Flower* 1. *Glumes* equal or unequal, persistent or caducous, 1-nerved or nerveless, emucronate, seldom keeled; lower often very small or almost obsolete; upper much shorter than, to as long as, the valve, lanceolate, sometimes acuminate, acute or obtuse, membranous. *Valve* 1, elliptic, obtuse, hyaline or similar in texture to the upper glume, glabrous. *Pale* equalling the valve or a little shorter, 2-nerved, often caniculate between the nerves, obtuse, truncate, emarginate or minutely bilobed, sometimes splitting at the base. *Lodicules* delicately hyaline, truncate. *Stamens* 2—3. *Ovary* often globose; styles free, plumose above. *Grain* either falling entire or often the pericarp remains attached to the rhachilla and the seed alone falls through the bursting of the pericarp; pericarp delicate, loose, more or less swelling in water; embryo $\frac{1}{2}$ or less than the length of the seed.

Annuals or perennials, sometimes with a creeping rootstock, sometimes stoloniferous; culms smooth, glabrous; leaves sometimes all basal; leaf-sheath ribbed, sometimes ciliate on the upper portion, glabrous, rarely pilose; ligule ciliate, sometimes reduced to a minute rim; blade usually narrow-linear or rolled or filiform or setaceous, more rarely flat, closely veined, with or without a midrib, sometimes ciliate with cartilaginous hairs, rarely scabrid on the margins, glabrous, more rarely pilose; inflorescence usually a lax panicle, sometimes a subraceme, more rarely contracted and spike-like or of spike-like racemes from the main rhachis; primary branches of inflorescence erect or horizontal, usually 2-nate or whorled on the main rhachis, simple or bearing a single spikelet, or branched, sometimes appearing almost spike-like owing to the crowding of the spikelets, sometimes very short so that the spikelets appear as if fascicled on the main rhachis.

Species about 80, natives of Asia, Africa, temperate and tropical America, and southern Europe; 40 species in South Africa, widely distributed. (Type: *S. indicus* R. Br.)

233 77. POLYPOGON Desv., Fl. Atlant., vol. 1, p. 66 (1798)

Spikelets solitary, subsessile, falling entire. *Glumes* equal or subequal, lanceolate, longer than the valve, keeled, entire or shortly 2-lobed, ciliate on the keel, membranous, each with a single awn, pubescent or glabrous; awns capillary, 2—12 times as long as the body of the glume. *Valve* 1, lanceolate or elliptic-oblong, truncate or emarginate, 5-nerved, with the lateral nerves shortly excurrent or evanescent, with the hyaline tip awned, glabrous; awn as long as to 6 times as long as the body of the valve, sometimes awn reduced to a mucro or absent, often deciduous. *Pale* slightly or much shorter than the valve, lanceolate acute, 2-keeled. *Lodicules* 2, delicate. *Ovary* glabrous; styles free, very short, loosely plumose above, laterally exerted. *Grain* oblong in outline, enclosed by the unaltered valve and pale; embryo small.

Annuals; culm ribbed, glabrous; leaf-sheath ribbed, rough; ligule membranous; blade flat, linear, closely ribbed, with a distinct midrib, scabrid, glabrous; inflorescence a dense terminal solitary spike-like panicle; spikelets often hidden by the numerous and long awns.

Species about 15, widely distributed in the temperate and warmer regions of both hemispheres; 3 species in South Africa, ranging from the northern Transvaal and Natal, through the coastal area to the Cape, and from South West Africa to Namaqualand and the van Rhynsdorp district; also recorded from the Hay district. (Type: *P. monspeliensis* Desv.)

242 78. AGROSTIS Linn., Sp. Pl., ed. 1, p. 61 (1753)

Spikelets solitary, peduncled, not falling entire. *Glumes* persistent, equal or subequal as long as to almost twice as long as the valve, lanceolate, linear, or oblong-lanceolate, sometimes acuminate, acute or obtuse, usually ciliate on the keel, sometimes scabrid, membranous, glabrous. *Valve* 1, lanceolate or linear, acute or obtuse, sometimes truncate and notched at the apex, awned from the back or awnless, 5- (rarely 3-) nerved, with the side nerves evanescent below and often excurrent into fine mucros or bristles, delicately membranous, glabrous or hairy. *Pale* usually shorter than the valve, sometimes much reduced or obsolete, 2-nerved, delicately hyaline. *Lodicules* 2, lanceolate, delicately hyaline. *Stamens* 3. *Ovary* ellipsoid; styles free, very short, plumose above, laterally exerted. *Grain* free, oblong in outline, enclosed in the scarcely altered valve and pale; embryo short.

Annuals or perennials of varying habit; culm 2—9-noded, sometimes the lower nodes rooting, smooth or slightly striate or more or less rough below the nodes; leaf-sheath ribbed, rough, glabrous; ligule long, membranous; blade narrow-linear, flat or rarely folded, acuminate, with a distinct midrib, scabrid or smooth, glabrous;

6. Lateral spikelets consisting of one female flower and 1-6 male flowers inserted above the female upon the distinctly developed axis of the spikelet; rarely male flowers reduced to empty glumes or wanting; utricle usually 2-cleft . . . **28. Schoenoxiphium, Nees**
 Lateral spikelets consisting only of 1 female flower and the usually rudimentary axis; utricle closed, entire or toothed . . . **29. Carex, Linn.**
7. Glume with one or two scales (bracteoles?) which envelope the flower . . . 8
 Glumes without scales (bracteoles?); hypogynous bristles present or absent . . . 9
8. Scales 2 . . . **1. Lipocarpa, R. Br.**
 Scale 1 . . . **2. Ascolepis, Steud.**
9. Ovary on a minute gynophore, surrounded by a small disc
10. Ficinia, Schrad.
 Ovary sessile, if on a small gynophore (cf. *Scirpus spp.*), then not surrounded by a disc . . . 10
10. Glumes long-awned, pubescent . . . **12. Fuirena, Rottb.**
 Glumes sometimes mucronate, if awned then not pubescent nor spikelet distichous . . . 11
11. Glumes distichous; hypogynous bristles 0 . . . 12
 Glumes spirally imbricate, or if sub-distichous then hypogynous bristles usually present . . . 17
12. Style-branches 2 . . . 13
 Style-branches 3 . . . 15
13. Inflorescence ovoid or cylindric, with the spikelets closely packed; spikelets of 4-7 glumes, with the lowest or 2 lowest bearing bisexual flowers . . . **9. Kyllinga, Rottb.**
 Inflorescence of several distinct lax spikelets; spikelets of many glumes, with the lowest 5 or more bearing bisexual flowers . . . 14
14. Nut laterally compressed . . . **5. Pycneus, Beauv.**
 Nut dorsally compressed . . . **6. Juncellus, C.B. Cl.**
15. Keel of fertile glumes narrowly winged . . . **8. Courtoisia, Nees**
 Keel of fertile glumes without wings . . . 16
16. Rhachilla usually wingless, persistent . . . **4. Cyperus, Linn.**
 Rhachilla winged; disarticulating above the two lowest empty glumes
7. Mariscus, Gaertn.
17. Hypogynous bristles absent . . . 18
 Hypogynous bristles present . . . 23
18. Male flowers or sterile flowers below the bisexual flower . . . 19
 Male flowers above the bisexual flower . . . 20
19. Axis of spikelet above the insertion of the nut elongated, thickened and curved round the nut . . . **19. Epischœnus, C.B. Cl.**
 Axis of spikelet not elongated nor curved round the nut
23. Tetraria, Beauv.
20. Style caducous; base enlarged and distinguished from the nut by a constriction or line . . . **15. Fimbristylis, Vahl.**
 Style deciduous or if persistent not distinguishable from top of nut . . . 21
21. Base of style persistent on the nut as a small button
16. Bulbostylis, Kunth
 Base of style not remaining as a button on the nut . . . 22
22. Stems without nodes between the basal leaves and the inflorescence; inflorescence a head, corymb, or spikelet solitary . . . **13. Scirpus, Linn.**
 Stems with leaves all the way up; inflorescence usually a long panicle . . . **21. Cladium, P.Br.**
23. Hypogynous bristles 3, feathered at the base and 3-fid above
17. Ecklonea, Steud.
 Hypogynous bristles glabrous or scabrid, not 3-fid . . . 24
24. Axis of spikelet bearing the fertile glumes elongated and flexuose
18. Schœnus, Linn.
 Axis of spikelet not elongated and flexuose above the fertile glumes . . . 25

25. Hypogynous bristles cut into narrow segments, appearing numerous
 11. *Eriophorum*, Linn.
 Hypogynous bristles 3-6, not cut into narrow segments 26
26. Inflorescence of one spikelet, producing many nuts 27
 Inflorescence rarely of one spikelet ; spikelets producing 1-2 nuts,
 rarely nuts many 28
27. Leaves present ; style deciduous, or if persistent then the base indis-
 tinguishable from the apex of the nut 13. *Scirpus*, Linn.
 Leaves 0 ; style persistent, distinguishable from the apex of the nut
 14. *Eleocharis*, R. Br.
28. Spikelets each with several nuts 13. *Scirpus*, Linn.
 Spikelets each with 1-2 nuts 29
29. Styles 2 22. *Rynchospora*, Vahl.
 Styles 3, rarely 6 or 8 30
30. Glumes spirally imbricate 24. *Macrochætium*, Steud.
 Glumes more or less 2-ranked 31
31. Plants of a more or less restiaceous habit ; lowest flower with a pistil
 which does not produce a nut 23. *Tetraria*, Beauv.
 Plants not of a restiaceous habit ; lowest flower male or perfecting
 a nut 32
32. Lowest flower perfecting a nut 3. *Carpha*, R. Br.
 Lowest flower male 8. *Costularia*, C.B. Cl.

452

1. LIPOCARPHA, R.Br.

Flowers bisexual and male or sterile. *Bracteoles* 2, very thin, scarious, parallel with the glume. *Hypogynous bristles* 0. *Stamens* 1-3. *Style* linear or 0, not dilated at the base, deciduous ; branches 2-3, minute or short. *Nut* sessile, obovoid or linear-oblong, unequally 3-angled.

Glabrous plants ; stems with leaves at the base only and without any nodes between them and the inflorescence ; inflorescence a dense head of 1-5 (rarely more) spikelets ; glumes densely packed and spirally imbricate ; 2 lowest glumes empty ; many succeeding glumes with bisexual flowers producing nuts ; uppermost glumes male or sterile.

Species 10, found in the warmer portions of both hemispheres ; 2 species recorded from Natal and the Transvaal, both of which occur in tropical Africa.

454

2. ASCOLEPIS, Steud.

Flowers bisexual and male or sterile. *Scale* within the glumes solitary, parallel with and longer than the glume and enclosing the flower. *Hypogynous bristles* 0. *Stamens* 2-3. *Style* small, linear ; branches 2-3, linear, minute. *Nut* very small, narrowly obovoid, 3-angled or biconvex, smooth.

Stem with basal leaves only and without nodes between the leaves and the inflorescence ; inflorescence a head of 1-5 spikelets ; spikelets of many spirally imbricate glumes ; the 2 lowest glumes empty ; many succeeding glumes with bisexual flowers producing nuts ; uppermost glumes male or sterile.

Species about 9 ; 1 species in Madagascar ; 1 in South America ; 1 in South Africa extending from the Katberg eastwards to Natal, the northern Transvaal, and the eastern O.F.S.

456

3. CARPHA, R.Br.

Flowers bisexual and male or sterile. *Hypogynous bristles* 6, as long as the nut, sometimes irregular. *Stamens* 3. *Style* long, linear ; branches 3, long. *Nut* sessile, ellipsoid, 3-angled, pyramidal at either end, acuminate, more or less hispid at the top.

Stem with leaves and nodes above the base ; inflorescence paniculate ; spikelets of 5-7 glumes ; 3 lowest glumes empty ; 1-2 succeeding glumes with bisexual flowers perfecting nuts ; upper glumes male or empty ; axis of spikelet short, not flexuose ; the lowest nut-bearing glume having the next glume close over it, not separated by an elongate curved joint of the rhachilla.

Species 12, confined to the southern Hemisphere (America, Australia and Africa) ; 3 species in South Africa, extending from the south-western districts, through Uitenhage and Albany to Pondoland.

459

4. CYPERUS, Linn.

Flowers bisexual and male or sterile. *Stamens* 1-3, anterior. *Style* slender, sometimes short ; branches 3, long, linear, or in one Cape species (*C. semitrifidus*) short, weak, or obsolete. *Nut* triangular or plano-convex, from narrow-oblong to obovoid in longitudinal section, smooth.

Usually glabrous ; leaves all near the base of the stem ; inflorescence a terminal corymb depressed into an apparent umbel, or reduced to a single head or spikelet ; spikelets of many (rarely 5-6) distichous glumes ; the 2 lowest glumes empty ; the succeeding glumes (3 to many) with bisexual flowers perfecting nuts ; the uppermost glume with a male or sterile flower ; rhachilla persistent, not disarticulating below the lowest fertile glume ; fertile glumes and nuts falling seriatim, beginning with the lowest.

Species about 300, found in all warm and temperate regions ; 50 species in South Africa, of which number at least 26 have been recorded from tropical Africa. The native species extend from Natal through the coastal belt to Clanwilliam ; rare in Namaqualand and the central districts ; also found in the Transvaal and O.F.S.

459a

5. PYCREUS, Beauv.

Flowers bisexual and male or sterile. *Stamens* 1-3, anterior ; anthers not crested. *Style* slender ; branches 2, linear, in a plane passing through the rhachilla. *Nut* oblong or ellipsoid, compressed laterally, smooth.

Glabrous ; leaves close to the base of the stem, rarely the stem partly covered with leaf-sheaths ; inflorescence a corymbose-panicle, shortened into a false umbel or head ; spikelets of many distichous glumes ; the 2 lowest glumes empty ; the succeeding glumes (5 to many) with bisexual flowers perfecting nuts ; the uppermost glume with a male or sterile flower ; rhachilla persistent wingless, not articulating below the lowest fertile glume.

Over 60 species in all tropical and warm temperate regions, a few extending to Canada and Queenstown ; 13 species in South Africa, of which number 11 are found in tropical Africa ; extending from Zululand and Natal through the coastal belt to Clanwilliam, though mostly eastern. Also found in the Transvaal and O.F.S. ; 1 species recorded from Griqualand West.

459b

6. JUNCCELLUS, C.B. Cl.

Flowers bisexual and male or sterile. *Stamens* 1-3, anterior. *Style* slender ; branches 2, linear, in a plane at right angles to the median plane of the spikelet. *Nut* oblong or ellipsoid, dorsally compressed, triangular, with the anterior angle flattened and smooth.

Stems from a creeping rhizome, with sheathing leaves at the base, sometimes produced into a small leaf ; spikelets of many distichous glumes ; the 2 lowest glumes empty ; the succeeding glumes (5 to many) with bisexual flowers perfecting nuts, the uppermost glume with a male or sterile flower ; rhachilla persistent, scarcely winged, not disarticulating below the lowest fertile glume.

Species 12, scattered in nearly all warm and temperate regions, but only one is recognised in South Africa, ranging from South West Africa along the coast to Natal ; also recorded from Parys in the O.F.S., and the Kimberley district.

459c

7. MARISCUS, Gaertn.

Flowers bisexual and male or sterile. *Stamens* 2-3. *Style* with 3 linear branches. *Nut* triangular or plano-convex, narrowly oblong, elliptic or oboval in longitudinal section, smooth.

Usually glabrous; leaves all near the base of the stem, never leafless; inflorescence as in *Cyperus*; spikelets of few to many distichous glumes; the two lowest glumes empty; the succeeding glumes with bisexual flowers producing nutlets (less than 5 nutlets to the spike); the uppermost glume with a male or sterile flower; rhachilla winged, disarticulating below the lowest fertile glume from a cushion, falling off in one piece.

Species about 180, in all warm and warm-temperate regions; a doubtful species is recorded from Europe; 26 species in South Africa, extending from the south-western districts to Natal, Zululand, and the Transvaal; also found in parts of the Karroo.

461

8. COURTOISIA, Nees

Flowers bisexual and male or sterile. *Style* persistent, 3-fid. *Nut* narrowly oblong, 3-angled.

Glabrous annuals; leaves all near the base of the stem, as long as the stem; inflorescence a simple or compound umbel; bracts similar to the leaves, overtopping the umbel; spikelets compressed, 4-12 together, clustered in sub-globose heads, 1-10-flowered, disarticulating in one piece above the two lowest empty glumes; fertile glumes distichous, boat-shaped, narrowly winged on the keel.

Species 2, one of which is common in India. The South African species found in the Transvaal, but also occurs in tropical Africa, Madagascar, and India.

462

9. KYLLINGA, Rottb.

Flowers bisexual and male or sterile. *Stamens* 1-3, anterior; anthers narrow, oblong, not crested. *Style* slender; branches 2, in a plane passing through the rhachilla. *Nut* oblong or ellipsoid, compressed laterally, smooth.

Glabrous, very rarely scabrous-pubescent; leaves all close to the base of the stem; inflorescence a head of 1-3 terminal sessile spikes, supported by 3-6 leaf-like bracts; spikes ovoid or cylindric, dense, with many small compressed spikelets; spikelets of 4-7 distichous glumes, 1-4-flowered; lowest (or 2 lowest) flower bisexual, perfecting a nut; upper flowers sterile, male, or uppermost glume empty; 2 lowest glumes smaller, empty; rhachilla wingless, falling off in the fruit by disarticulation from a cushion below the lowest fertile flower.

Species about 45, found in all warm countries, but by far the largest number found in Africa; 10 species in South Africa, extending from Malmesbury through the coastal districts to Natal, Zululand and the Transvaal; also found in some central districts to Griqualand West.

465

10. FICINIA, Schrad.

Flowers bisexual and male or sterile. *Hypogynous bristles* 0. *Stamens* 2-3, anterior. *Ovary* on a minute obpyramidal gynophore, surrounded by a small-lobed somewhat fleshy outgrowth (a disc); style glabrous, linear, passing gradually into the nut; branches 3, rarely 2. *Nut* triangular, or rarely dorsally compressed.

Stem with leaves at the base only or leafless; inflorescence a head, or heads umbellate, or spikelets solitary; spikelets of many (rarely few) spirally imbricate glumes; the lowest 1-2 glumes empty; many or several succeeding glumes bisexual and perfecting nuts; the uppermost glumes male or sterile.

Species about 50, which with few exceptions are almost entirely confined to the south-west coast region of the Cape Province, though recorded from Namaqualand and sparsely distributed through the eastern districts into Natal.

466

11. ERIOPHORUM, Linn.

Characters as in *Scirpus*, but hypogynous bristles 6, strap-shaped and cut down to the base into several narrow segments which elongate in fruit, rendering the spikelet comose.

Species about 10, found in the north temperate or Arctic regions, 2 in India and China ; a single species found in the Transvaal.

467

12. FUIRENA, Rottb.

Flowers bisexual and male or sterile. *Hypogynous bristles* 6 or none. *Stamens* 3, anterior. *Style* linear, often short, with the base usually persistent on the nut ; branches 3, long. *Nut* sessile, 3-angled, obovoid or narrowly obovoid, falling off enclosed by the 3 inner hypogynous bristles when these are present.

Rhizome (in the South African species) woody, horizontal ; stems with nodes and leaves throughout their length (except in one species) ; leaves with ligules ; inflorescence a panicle-corymb, elongated, thin, with remote lower branches, often reduced nearly to a sub-terminal head, sometimes to a few (or 3) spikelets ; spikelets of many imbricate glumes ; the 2 lowest glumes empty ; many succeeding glumes with bisexual flowers, aristate, hairy ; uppermost glumes male or sterile.

Species about 26, in all warm countries ; 10 species in South Africa, extending from the Transvaal, Natal and Basutoland through the eastern districts to the south-western region ; also recorded from Graaff-Reinet, Queenstown, and Aliwal North.

468

13. SCIRPUS, Linn.

Flowers bisexual and male or sterile. *Hypogynous bristles* usually retrorse-scabrid, very rarely plumose, sometimes 0. *Stamens* 1-3, anterior. *Ovary* sessile or stalked ; style long, linear, or hardly any, deciduous, or if persistent the base undistinguishable from the top of the nut ; branches 2-3, linear. *Nut* obovoid or oblong, 3-angled or biconvex, without a beak.

Stems without nodes between the basal leaves and the inflorescence ; inflorescence a head, or a corymb which is depressed into an apparent umbel, or spikelet solitary ; spikelets of many, rarely few, spirally imbricate glumes ; lowest 1-2 glumes empty ; many or several succeeding glumes bisexual and perfecting nuts ; uppermost glumes male or sterile.

Species about 136, spread throughout the world ; almost 60 species are found in South Africa many of which also occur in tropical Africa. Extend from Natal along the coastal belt into Namaqualand, rarer in central districts ; also found in the O.F.S. and in the Transvaal.

469

14. ELEOCHARIS, R.Br.

Flowers bisexual and male or sterile. *Hypogynous bristles* 3-7, scabrous, or 0 (in South African species). *Stamens* 1-3, anterior. *Style* thickened at the base, distinguishable from the apex of the nuts, persistent ; branches 2-3. *Nut* triangular or flat (dorsally compressed).

Glabrous ; stem with one terminal spikelet ; leaves 0 ; uppermost sheath truncate or very shortly produced on one side ; spikelet of many spirally imbricate glumes ; lowest 1-2 glumes empty, shorter than the spikelet ; many succeeding glumes with bisexual flowers perfecting nuts ; the uppermost glumes male or sterile.

Species about 115, scattered over nearly the whole world, prevalent in America ; 5 species in South Africa, extending from the Transvaal and Natal through the south-eastern and eastern districts to Malmesbury ; recorded also from some central districts to Griqualand West.

471

15. FIMBRISTYLIS, Vahl.

Flowers bisexual and male or sterile. *Hypogynous bristles* 0. *Stamens* 1-3. *Style* 2-3-fid, villous or glabrous, with the base enlarged and distinct from the nut by a constriction or a line, continuous with and caducous with the style. *Nut* 3-angled or biconvex, according as the style branches are 3 or 2.

Glabrous or hairy; stolons 0 or very short; leaves all near the base of the stem, sometimes 0; inflorescence a simple compound or congested umbel, or a single spikelet; spikelets of many glumes spirally imbricate, very rarely sub-distichous; lowest 1 or 2 glumes empty; many or several succeeding glumes bisexual and perfecting nuts; uppermost glumes male or sterile.

Species about 125, in all hot and warm temperate areas, especially plentiful in south-east Asia and north-east Australia; 8 species in South Africa, all of which are found in tropical Africa; recorded from Natal, through the eastern districts to Albany and then in Clanwilliam; also found in the O.F.S. and in the Transvaal.

471a

16. BULBOSTYLIS, Kunth

Flowers bisexual, and male or sterile. *Hypogynous bristles* 0. *Stamens* 2-3, anterior. *Style* glabrous, linear, deciduous, leaving its enlarged base as a dark coloured button on the nut; branches 3, very rarely 2. *Nut* obovoid, very obtuse or truncate, pallid till quite ripe.

Stolons 0; stems slender; leaves all near the base of the stem, very narrow (nearly always setaceous or capillary), often hairy, nearly always ciliate-hairy in the mouth of the sheaths; inflorescence a terminal simple or compound umbel, or reduced to a head or one spikelet; spikelet of many spirally imbricate glumes; the lowest 1-2 glumes empty; many or several succeeding glumes bisexual and perfecting nuts; the uppermost glumes male or sterile; flower glumes nearly always pubescent on the back.

Species about 75, in the tropics or warmer regions of the world, especially in Africa and America, where one species extends north to Canada; 15 species in South Africa, 10 of which also occur in tropical Africa; extending from the Transvaal, Natal, and Basutoland to Alexandria; 1 species recorded from the Cape.

475

17. ECKLONEA, Steud.

Structure of spikelet and flower as in *Carpha* but *hypogynous bristles* 3, feathered at the base, 3-fid at the tip.

Stem with leaves or bracts throughout their length; inflorescence a panicle of 1-4 distant heads.

Endemic; species 1, only known from the Cape, Wellington, and the Caledon districts.

477

18. SCHOENUS, Linn.

Flowers bisexual and male or sterile. *Hypogynous bristles* various or 0 (in the only South African species 3-5, smaller than the nut and more or less fringed). *Stamens* 1-6 (3 in the South African species). *Style* linear, continuous with the nut; style-base small, conic, or hardly any; branches 3, linear. *Nut* sessile or stalked, 3-angled or the anterior angle rounded.

Stolons 0; stems stoutly tufted; leaves near the base; inflorescence a panicle, corymb, or a head; spikelet of 6-10 glumes; lowest 1-6 glumes empty; 1-3 succeeding glumes with bisexual flowers perfecting nuts; upper glumes close together, male or empty; the part of the axis bearing the fertile glumes is elongated, flexuose, so that the lowest nut stands in an excavation or deep bend of it.

Species about 58, 1 in Europe, 1 in North America and the remainder Australian; 1 species (the European) is confined to the Cape Peninsula and the Worcester district, but is also known from tropical Africa.

477a

19. EPISCHÆNUS, C.B. Cl.

Flowers bisexual and male. *Hypogynous bristles* 0. *Stamens* 3-5. *Style* deciduous; branches 3. *Nut* sub-globose, obscurely 3-angled, smooth, marble-white.

Stems tufted, conspicuously quadrangular at the top, with nodes near the base only; inflorescence a linear raceme of 4 spikelets; spikelets 1-2 in each bract, of 7 sub-distichous glumes; 3 lowest glumes empty; 4th and 5th glumes with male flowers; 6th glume with a bisexual flower, perfecting a nut; 7th glume small, empty; axis of spikelet above the insertion of the nut elongated, thickened, curved round the nut.

Endemic; species 1, recorded from the Caledon and Riversdale districts.

482

20. COSTULARIA, C.B. Cl.

Flowers bisexual and male. *Hypogynous bristles* 5 or 6, slender. *Stamens* 3. *Style* long; branches 3. *Nut* oblong-obovoid, 3-angled, crowned by the pyramidal persistent style-base.

Rather stout plants; stems with nodes bearing leaves throughout their whole length; inflorescence an oblong compound panicle of many spikelets; spikelets of several or many sub-distichous glumes; lowest 3-4 (or more) glumes empty; next glume with a male flower; glume above the male flower containing a bisexual flower (rarely 2 glumes with bisexual flowers) which perfects a nut; upper glumes male or empty; axis of spikelet above the insertion of the nut neither elongated nor thickened and curved.

Species 6-7, found in the Mascarene Islands, Australia, and South Africa; 2 species recorded from Natal, the northern Transvaal, Knysna, and the Cape Peninsula.

489

21. CLADIUM, P.Br.

Flowers bisexual and some reduced. *Hypogynous bristles* 0 (in the South African species), or rarely present and small. *Stamens* 2-3. *Style* linear, thickened at the base; branches 3, long. *Nut* small, 3-angled, crowned by the enlarged style-base and continuous with it, not distinguishable by a transverse constriction or line.

Mostly robust plants of varied habit; inflorescence usually a long panicle, sometimes shortly corymbose, never umbellate; spikelets of 4-11 spirally imbricate glumes, perfecting 1-3 (rarely more) nuts; 3-4 lowest glumes empty; next glume containing a bisexual flower perfecting a nut; uppermost glumes with reduced flowers; rachilla not elongated above the lowest fertile glume.

Species 44, mostly insular or near the sea; 1 species, which is almost cosmopolitan, in South Africa, and extends from the south-western coast districts to Natal, Zululand, and the Transvaal; also found in Griqualand West.

492

22. RYNCHOSPORA, Vahl.

Flowers bisexual and male or sterile. *Hypogynous bristles* 6, as long as the nut, linear, scabrous (in the South African species), or 0, or various (in extra South African species). *Stamens* 2-3. *Style* long, linear, dilated at the base, persistent; branches 2, long-linear, or nearly obsolete. *Nut* obovoid to narrowly oblong, flattened.

Stem (in the South African species) with leaves and nodes between the base and the inflorescence; inflorescence a head of one or more spikelets; spikelets of spirally imbricate glumes; 3-4 lowest glumes empty; 1-2 succeeding glumes with bisexual flowers perfecting nuts; the uppermost glumes sterile or male.

Species about 184, throughout the world, especially abundant in America; 4 species in South Africa, extending from Natal to Pondoland; one of these is also found in the Cape Peninsula and in the Transvaal; 3 of the native species occur in tropical Africa.

494

23. TETRARIA, Beauv.

Flowers bisexual and male or very rarely unisexual, *Hypogynous bristles* various or 0. *Stamens* 3, sometimes 4, more rarely 6 or 8; anthers crested, often eared at the base. *Style* continuous with the nut, dilated and scabrous at the base, linear; branches 3-4, in a few species 6 or 8, long, linear. *Nut* obovoid, 3-angled or sub-4-angled.

Plants of a more or less restiaceous habit; leaves all basal or produced up the stem; spikelets 2-flowered, of several (or many) sub-distichous glumes; lowest 4-10 glumes empty; the next glume with a male flower or very rarely empty; next glume with a bisexual flower perfecting a nut; upper glume often small or 0; spikelets very rarely unisexual; axis of the spikelet not elongated nor curved round the nut.

Species 35; endemic, except *T. circinalis*, which is also found in East Africa. The species almost confined to the south-western districts of the Cape Province; a few found in the Ceres district and a few extending as far as Riversdale, but also recorded from the Queenstown district.

494a

24. MACROCHÆTIUM, Steud.

Flowers bisexual, sometimes also male flowers present. *Hypogynous bristles* 6, long, linear. *Stamens* 6. *Style* with a dilated base forming a beak on the nut; branches 3, long. *Nut* rather small, obovoid, 3-angled, sessile.

Habit of the large species of *Tetralia*; spikelet of 4-5 spirally imbricate glumes, with one perfect flower, an upper male flower being sometimes added.

Endemic; species 1, extending from the Cape Peninsula to Uitenhage.

500

25. CHRYSITHRIX, Linn.

Flowers unisexual. *Hypogynous bristles* 0. *Stamen* 1; anther linear, with a long linear crest. *Style* long, linear, not dilated at the base; branches 3, linear. *Nut* ovoid, sub-globose, pale, longitudinally many-striate.

Leaves all basal; inflorescence a single spikelet, bearing a single terminal female flower; surrounded by a number of linear bracts, a number of which have 1 stamen.

Endemic; species 2, extending from the Cape Peninsula to George and the Uitenhage districts.

512

26. ERIOSPORA, A. Rich.

Flowers unisexual. *Hypogynous bristles* numerous, linear. *Stamens* 1-3; anthers not crested. *Style* linear, widening at the base into an elongate conical 3-angled portion, which is situated on the nut as a beak; branches 3. *Nut* from an ovoid base, tapering into the beak.

Perennials, with linear leaves; leaves resembling those of grasses; stems with nodes their whole length bearing leaves or bracts; inflorescence usually an elongated panicle (2-3 in. long in the South African species); spikes on slender peduncles; spikelets mostly bearing flowers of both sexes, 2-3-flowered, about 4-glumed; the lowest flower female; the upper 1-2 male or sterile; glumes ovate, boat-shaped, obscurely distichous, very minutely mucronulate.

Species 7, scattered through tropical Africa and Madagascar; 1 species only known from Pretoria, Johannesburg, and the northern Transvaal.

515

27. SCLERIA, Berg.

Flowers unisexual. *Hypogynous bristles* 0. *Stamens* 1-3; anthers often mucronate. *Style* linear, not dilated at the base; branches 3, linear. *Nut* bony, ovoid, on a gynophore; apex of gynophore often dilated into a disc, simple, trigonous, or compound, or with evolute lobes.

Stems generally 3-angled, with nodes throughout their length ; basal leaves and bracts sheathing the stem, narrow, often very scabrous at the edges, cutting ; inflorescence paniced, often scattered ; spikelets bearing flowers of one or both sexes ; the bisexual spikelets with one basal flower and 1 or few male flowers above ; female spikelet like the bisexual spikelet but the upper male portion reduced to 1 or 2 empty glumes or wanting ; male spikelets like the bisexual spikelet, but without the basal female flower, and often with more numerous male flowers.

Species about 160, found in all tropical and sub-tropical regions except the Mediterranean and Orient ; 12 species in South Africa, extending from Natal and the Transvaal to Albany ; most of these also occur in tropical Africa.

521

28. SCHÆNOXIPHIUM, Nees

Flowers unisexual. *Hypogynous bristles* 0. *Stamens* 1-3. *Style* 3-fid. *Nut* 3-angled or flattened.

Stems nodose ; inflorescence a long panicle, with distant axillary branches ; spikelets numerous, bearing flowers of one or both sexes ; bisexual spikelet with one female flower at the base and several male flowers on a stalk springing obliquely within the so-called glume of the female flower ; glume of female flower free or connate a very little way up from the base ; axis of spikelet below the male inflorescence flattened and scabrous on the margin.

Endemic ; species 8, mainly confined to the south-eastern and eastern districts, but extend to the Cape Peninsula ; also recorded from the O.F.S.

525

29. CAREX, Linn.

Flowers unisexual. *Hypogynous bristles* 0. *Stamens* 1-3. *Style-branches* 2-3. *Nut* trigonous or flattened.

Perennial herbs ; leaves grass-like ; inflorescence usually a pseudo-spikelet, more rarely a true compound spikelet ; in the latter case axis of so-called spikelet distinctly branched, with the branches bearing a female flower in the axil of the first floral glume and male flowers in the succeeding glumes, thus forming a true compound spikelet with each lateral branch a true spikelet ; in the former case the lateral branches are suppressed and a pseudo-spikelet is formed and the female flower appears to arise almost directly from the main axis and is surrounded by a more or less closed structure, the utricle ; pseudo-spikelets often with female flowers only but may have female flowers in the lower portion and male flowers in the upper portion forming a so-called androgynous spikelet.

Species 1,400 scattered throughout the world, from the Arctic Circle to the southernmost limits of the phanerogams ; 14 species in South Africa, widely distributed from Little Namaqualand through the coastal belt to Natal and into the Transvaal ; a few occur in the central districts.

14. PALMÆ.

Flowers unisexual. *Calyx* 3-lobed. *Petals* 3, usually valvate in the male flowers, imbricate in the female flowers. *Stamens* 3 or 6 (usually 6), hypogynous or perigynous. *Ovary* superior, 1-3-chambered, or of three carpels, with 1-2 ovules in each chamber ; stigmas 3, usually sessile. *Fruit* a 1-3-locular drupe, or hard berry, or of 1-3 carpels ; pericarp smooth, rough, or clothed with shining scales that imbricate downwards. Seeds erect or laterally attached, rarely pendulous ; endosperm horny or bony, solid or ruminate ; embryo small, in a small cavity near the surface of the endosperm.

Shrubs or trees, naked or prickly, rarely pubescent ; stem erect, scandent, or decumbent, rarely branched above ; leaves alternate, plaited in bud, pinnati-

sect or palmate, rarely simple or bipinnate, with a sheathing petiole ; inflorescence a panicle or spike enclosed in one or more large sheathing bracts (spathes) ; flowers usually 3-bracteate.

Genera about 140 ; species about 1,200, widely spread through the tropics and sub-tropics of both hemispheres.

Tribe **Phœniceæ** : Pistil formed of 3 free carpels, sometimes slightly cohering at the base ; each carpel (or by abortion 1 only) developing into a 1-seeded berry ; leaves pseudo-pinnate (genus 1).

Tribe **Borasseæ** : Pistil formed of 3 connate carpels, each one developing into a nut with a strong stony shell ; leaves palmate (genus 2).

Tribe **Metroxyleæ** : Ovary completely or incompletely 3-chambered ; fruit covered with imbricating deflexed scales ; leaves pinnatisect (genus 3).

Tribe **Cocoinæ** : Pistil formed of 3 connate carpels which develop into a simple nut with a fibrous pericarp ; leaves pseudo-pinnate (genus 4).

- | | |
|---|-----------------------------|
| 1. Leaves fan-shaped | 2. Hypæhne , Gaertn. |
| Leaves pinnate or pinnatisect | 2 |
| 2. Fruit with many thick descending imbricate scales | 3. Raphia , Beauv. |
| Pericarp fleshy or divided into small granular clusters | 3 |
| 3. Stamens 6 | 1. Phoenix , Linn. |
| Stamens 8-16 | 4. Jubæopsis , Becc. |

528

1. PHŒNIX, Linn.

Plants dioecious. *Male flowers* oblong. *Calyx* cupular, 3-toothed. *Petals* 3, obliquely-ovate, valvate. *Stamens* 6 ; filaments connate at the base. *Ovary* rudimentary or none. *Female flowers* globose. *Calyx* as in the male. *Petals* 3, rounded, concave, imbricate. *Staminodes* 6. *Carpels* 3, free, with an erect ovule in each ovary ; stigma sessile. *Fruit* oblong, 1-seeded, with a fleshy pericarp ; stigma terminal. *Seed* oblong, grooved on the ventral side.

Trees ; leaves pinnate ; leaflets lanceolate or ensiform, sides induplicate ; the lower pinnae armed with spines ; spathe solitary ; spadices usually several, interfoliar, erect, or drooping in fruit, branched ; flowers small, yellow.

Species about 12, in tropical and sub-tropical Asia and Africa ; 1 species in South Africa, found in the eastern districts and Natal but comes as far south as the Bushman's River ; also occurs in tropical Africa.

553

2. HYPHÆNE, Gaertn.

Plants dioecious. *Male flowers* : *Calyx* 3-lobed, imbricate. *Petals* ovate, concave, connate into a short stalk at the base, glumaceous, imbricate. *Stamens* 6 ; filaments short. *Ovary* none. *Female flowers* shortly pedicelled, larger than the male. *Sepals* ovate, orbicular, obtuse, imbricate. *Petals* slightly smaller than the sepals, widely ovate, obtuse, imbricate. *Staminodes* 6, connate into a membranous cup. *Ovary* sub-globose, obscurely 3-lobed, 3-chambered, with a single ovule in each chamber ; stigmas 3, sessile. *Fruit* sessile or stalked, 1-locular ; stigma basilar ; pericarp divided into small granular clusters ; endocarp woody. *Seed* adnate to the endocarp, which is intruded at the base ; raphe with reticulate branches ; endosperm bony.

Medium or large trees, unarmed or slightly spiny ; leaves fan-shaped ; petiole ending in a small ligule ; spadices with cylindric spathes ; branches alternate with sub-fastigiate branchlets ; bracts semi-circular, very densely imbricate ; bracteoles membranous ; flowers immersed in the branchlets, the male in pairs, the female solitary.

Species about 9, dispersed through tropical Africa, Arabia, and the Mascarene Islands ; 1 species in Natal and the northern Transvaal ; also occurs in tropical Africa.

559

3. RAPHIA, Beauv.

Plants monoecious. *Male flowers*: *Calyx* tubular, with a truncate or minutely denticulate mouth. *Corolla-tube* curved, contracted, solid and 3-angled at the base; lobes 3, linear-lanceolate, valvate. *Stamens* 6-16, inserted at the base of the perianth; filaments connate at the base. *Ovary* none. *Female flower* larger than the male. *Calyx* and *corolla* as in the male. *Staminodes* in a 6 to many-toothed cup. *Ovary* ovoid, 3-chambered, with a single ovule in each chamber. *Fruit* large, oblong, ovoid, or ellipsoid, beaked, 1-locular, 1-seeded; stigma terminal, pericarp covered with thick descending imbricate scales. *Seed* oblong, furrowed; endosperm bony.

Stem short or tall, simple or branched, unarmed or the sheaths armed; leaves terminal, sub-erect, pinnatisect; segments linear-lanceolate, with the margins at the base with recurved setae or thorns; petiole cylindric or convex on the back, flat on the face; sheath short, with the margins long fibrous; spadices large, pendulous, cylindric, densely racemose, without a common spathe; bracts cup-shaped; flowers elongate, long exserted; the male at the base of the ultimate branches of the spadix; the female at the apex.

Species 6 or 7, in tropical Africa and Madagascar; one species in South America and South Africa (Zululand).

665a

4. JUBÆOPSIS, Becc.

Plants monoecious. *Male flowers* sessile, asymmetric. *Sepals* free, squamæform, small, triangular, distinctly imbricate at the base. *Petals* much larger than the sepals, coriaceous, acuminate, valvate. *Stamens* 8-16, slightly shorter than the petals; filaments terete, not inflexed at the apex; anthers linear, dorsifixed. *Ovary* rudimentary, columnar above, slightly 3-toothed. *Female flowers* ovate-conical. *Sepals* broadly imbricate. *Petals* convolute-imbricate, with an obtuse apiculus. *Staminodes* rudimentary, short, annular, scarcely toothed. *Ovary* ovoid-conical, minutely 3-chambered at the very base, sometimes only 2 by abortion, with the septa soon disappearing, with a single ovule in each chamber. *Fruit* globose, 1-seeded; stigma terminal, with 3 pores above the middle and with a single band within; pericarp fibrous; endocarp bony. *Seed* globose; endosperm cartilaginous, oily, with a conspicuous cavity; embryo opposite one of the pores.

A tree; leaves pinnatisect: segments joined, ensiform, reduplicate at the base, unequal, bifid or 2-toothed at the apex; spadices between the leaves racemose; inner spathes fusiform, opening ventrally, woody, smooth outside; male flowers solitary, numerous in the upper part of the branches; female flowers sessile in the lower part, alternate, stipitate, with a male flower on either side.

Endemic; species 1, recorded only from Pondoland.

15. ARACEÆ.

Flowers unisexual or bisexual, with or without a perianth, sessile on a spadix enclosed within, adnate to, or subtended by, a green or coloured spathe. *Spadix* usually bearing flowers of both sexes or rarely unisexual, with or without a terminal barren appendix, and with or without neuter organs on various parts of it, or entirely covered with bisexual flowers. *Perianth*, when present, of 4-9 free or connate segments. *Stamens* 4-6, rarely more or fewer (when the male flowers have no perianth, the stamens are so crowded that the number belonging to each flower cannot be determined), free or connate; filaments none, or broad and flat, or rarely filiform. *Ovary* superior or

rarely inferior, 1 to many-chambered, with 1 to many ovules in each chamber on axile parietal basal or apical placentas; style present or none; stigma entire or lobed. *Fruit* a 1 to many-seeded berry. *Seed* with or without endosperm.

Herbs or shrubs, with a thick fleshy or tuberous root-stock, or with erect creeping or climbing simple or branched stems; leaves alternate, radical or cauline, usually with sheathing petioles; spathe open to the base or the lower part convolute or tubular, wholly deciduous, or persistent, or only the tubular part persistent.

Genera about 100 with about 1,000 species, chiefly concentrated in the tropics.

1. An aquatic herb; female part of spadix adnate to the spathe

3. *Pistia*, Linn.

Terrestrial herbs, with tuberous root-stocks; spadix free 2

2. Spathe tubular below, at length deciduous 2. *Stylochiton*, Leprieur.
Spathe convolute below, persistent 1. *Zantedeschia*, Spreng.

748

1. ZANTEDESCHIA, Spreng.

Flowers unisexual. *Perianth* none. *Male flowers* of free crowded stamens with sessile anthers opening by terminal pores. *Female flowers* of naked ovaries. *Ovaries* in several spirals, sub-globose, angular from mutual pressure, 2-3-chambered, with 2-4 ovules in each chamber on axile placentas; style short or almost none; stigma discoid. *Fruit* a 1-3-locular berry, with 1-2 seeds in each loculus. *Seed* sub-globose or ovoid; testa rather thin; endosperm copious.

Herbs with the habit of *Arum*; rootstock a thick fleshy rhizome; leaves all radical, with long petioles and hastate sagittate cordate or lanceolate blades, contemporary with the flowers; peduncles as long as or longer than the leaves; spathe persistent, with a convolute narrowly funnel-shaped tube, broadest at the mouth, with an oblique open sub-erect or recurving limb terminated by a subulate point; spadix bearing male and female flowers, free, sessile or stalked, much shorter than the spathe; the basal part female; the upper part male.

An African genus of 7 or 8 species, mostly South African, chiefly in the north-eastern and eastern districts, extending to Aliwal North and in the coast belt to the Cape Peninsula; 2 species occur in tropical Africa.

764

2. STYLOCHITON, Leprieur

Flowers unisexual. *Female flowers* free, or connate in a single cycle, or in 2-5 spirals, crowded, laterally compressed or angular from mutual pressure; the uppermost often imperfectly bisexual. *Perianth* gamophyllous, cupular or sub-urceolate, truncate. *Staminodes* none. *Ovary* superior or inferior, 1-chambered, or 2-4-chambered in the lower part; ovules 2 to several in each chamber; style exserted; stigma discoid-capitate. *Male flowers* numerous. *Perianth* as in the female, but less deep and not contracted at the mouth. *Stamens* 4, inserted at the base of a rudimentary ovary, exserted.

Perennial herbs with the habit of *Arum*; rhizome stout, fleshy, nodose or ringed; leaves all radical, petiolate, cordate, sagittate, hastate, or rarely entire at the base, contemporary with the flowers or appearing after them; peduncle terminal or axillary, solitary, short; spathe tubular below; limb expanded or hooded, at length entirely deciduous; spadix bearing male and female flowers, free, usually with a naked space between the male and female parts, or the base of the male part more or less interrupted, without neuter organs or appendix.

Species about 10, all African; 2 species recorded from the Transvaal and Natal.

791

3. PISTIA, Linn.

Flowers unisexual. *Perianth* none. *Male inflorescence* of a stipitate whorl of 3-8 flowers, each flower composed of 2 connate 2-thealous anthers opening by short slits. *Female inflorescence* of a single ovary, apparently arising from the back of the spathe, very oblique, 1-chambered, with numerous basal ovules; style oblique, erect from the top of the ovary; stigma capitate. *Fruit* ellipsoid, with a thin pericarp, many-seeded. *Seeds* cylindric-oblong, truncate at each end, depressed at the apex and with an operculum closing the micropyle, rugulose; endosperm present.

A floating stoloniferous stemless herb, with a tuft of fibrous roots; leaves in a rosette, with flabellate veins raised beneath; spathes axillary, small, tubular below, with the limb open, oblique, constricted on each side at its base; spadix shorter than the spathe, bearing male and female flowers, with the female part adnate to the back of the spathe and the male part free, stipitate, having two neuter organs at its base: the upper cup-shaped or frill-like; the lower sub-orbicular or sub-reniform in outline, with the sides bent inwards or downwards.

Species 1, found throughout the tropical and sub-tropical regions of the globe in still, fresh water; recorded from Natal.

16. LEMNACEÆ.

Flowers very minute, seated in a cavity at the margin or in the upper surface of the frond, consisting of 1-2 stamens accompanied by a sessile ovary, either naked or enclosed in a membranous spathe, which ruptures irregularly as the stamens mature. *Stamens* exerted from the frond; anther 1-2-thealous. *Ovary* 1-chambered, with 1 or several basal ovules; narrowed into a style, or with a sub-sessile stigma. *Fruit* 1 to several seeded, indehiscent or opening transversely. *Seeds* minute; endosperm present.

Small or minute gregarious floating plants, consisting of sub-orbicular elliptic obovate oblong or linear fronds; fronds flat on both sides, or more or less convex beneath, sometimes as thick as broad, rootless or producing one or more roots from the middle of the under surface.

Genera 2; species about 21; found in still water in all warm and temperate countries.

Frond with one or more roots; flowers seated in a cavity at the margin of the frond 1. *Lemna*, Linn.

Frond rootless; flowers seated in a cavity in the upper surface of the frond 2. *Wolffia*, Horkel.

795

1. LEMNA, Linn.

Flowers very minute, very rarely seen in some of the species, seated in a cavity at the margin of the frond, enclosed in a minute membranous spathe. *Stamens* 1-2; anthers 2-thealous, with the thecae opening by transverse slits.

Fronds small or minute, with one or more roots on their under surface, floating on still water, thin and flat, or flat above and more or less convex beneath, orbicular, elliptic, oblong, or spatulate in outline, entire or in one species minutely denticulate on the margin; roots tipped with a distinct sheath-like root-cap.

Species 9, in all warm and temperate countries; 2 species in South Africa, extending from Clanwilliam along the coastal belt into Natal.

796

2. WOLFFIA, Horkel

Flowers rarely seen, microscopic, seated in a cavity on the upper surface of the frond, without a spathe. *Stamen* 1; anther 1-theous, opening by a slit across the top, the valves becoming reflexed.

Fronds small or minute, entirely without roots, but in 2 species a root-like hair, quite destitute of a root-cap, is developed from the under side, floating on still water, thin and flat, or as thick as broad, sub-globular, hemispherical, ellipsoidal, elliptic, oblong, or linear, entire or rarely minutely toothed at the margin or end of the frond.

Species about 12, in all warm and temperate countries; 2 species recorded from Natal and the Transvaal.

17. FLAGELLARIACEÆ.

Flowers regular, bisexual or unisexual. *Perianth* 6-partite, persistent; segments in 2 rows, sub-petaloid or scarious. *Stamens* 6, hypogynous or shortly adnate to the base of the perianth-segments. *Ovary* superior, 3-chambered, with a single ovule in each chamber; style short or none; stigma 3-lobed and sessile or of 3 linear spreading branches. *Fruit* a 1-3-seeded berry. *Seeds* with a crustaceous testa and a copious starchy endosperm; embryo minute.

Robust herbs, bearing leaves up to the base of the inflorescence, sometimes climbing by means of tendrils at the tips of the leaves; leaves alternate, elongate, sheathing at the base; inflorescence a terminal panicle; flowers sessile or subsessile.

Genera 3, with about 8 species confined to the warm regions of the Old World.

798

1. FLAGELLARIA, Linn.

Flowers bisexual. *Perianth* sub-petaloid; segments oblong, obtuse, with the 3 outer slightly shorter than the 3 inner. *Stamens* 6, hypogynous; filaments ultimately long and much exerted. *Ovary* with a short style and 3 linear stigmas. *Berry* 1-(rarely 2-) seeded.

Stem sarmentose, climbing by means of the tendril-tipped leaves; panicle terminal; flowers small, spicate at the ends of the ultimate branchlets of the panicle.

Species 3, one African, one in Fiji, and the third widely dispersed in the tropics of the Old World, but apparently not occurring on the continent of America. The South African species extends southwards from the tropics to East London.

18. RESTIONACEÆ.

Plants dicecious, rarely monoecious. *Flowers* unisexual, very rarely bisexual. *Perianth* glumaceous, usually of 6 segments in 2 series, occasionally of less, rarely absent; segments all similar, or the outer different from the inner; outer lateral segments frequently conduplicate and more or less keeled; inner segments usually rounded on the outer side. *Stamens* 3, opposite the inner perianth-segments; filaments very slender; anthers 1-theous. *Rudimentary* ovary in the male flower with 2 or 3 imperfectly developed styles or absent. *Female inflorescence* usually like the male except in most of the 1-flowered species. *Staminodes* 2 or 3, opposite the inner perianth-segments, or absent. *Ovary* superior, 3-chambered or

1-2-chambered by abortion, with a solitary pendulous ovule in each chamber; styles 1, 2, or 3, free or more or less united from the base upwards. Fruit a 2-3-(or by abortion 1-) seeded capsule or a nut.

Perennial, rush or sedge-like herbs, with a tufted or creeping rootstock densely covered with scaly sheaths; stems erect or rarely reclining, simple or branched, terete, quadrate or compressed, solid or fistular, with a leaf-sheath at each node; leaf-sheaths usually convolute, free at the margins, rarely produced at the apex into a leaf-like mucro, deciduous or persistent; inflorescence spike-like or branched, alike or different in the sexes; spikelets usually many, often solitary, 1-, few-, or many-flowered, each usually with a sheath-like spathe at the base.

Genera about 20 with about 230 species, for the most part confined to the south-western portion of the Cape Province, but also found in the south-western portion of Australia and in New Zealand and Tasmania. One species has been found in tropical Africa, one in Cochin China and one in Chili.

Tribe **Restioideæ**: Ovary 3-, 2- (or rarely by abortion 1-) chambered; fruit a 1-3-seeded capsule (genera 1-2).

Tribe **Willdenowięæ**: Ovary 1-chambered; fruit a nut (genera 3-12).

1. Flowers bisexual; plants rarely monoecious, but if so then fruit a nut

12. Phyllocomos, Mast.

Flowers unisexual; plants dioecious, very rarely monoecious, but if so then fruit a capsule 2

2. Ovary 2-, 3- (or rarely by abortion 1-) chambered; fruit a 1-3-seeded capsule 3

Ovary 1-chambered; fruit a nut 4

3. Sheaths of the stem persistent; inner segments of the male and female flowers not or scarcely exceeding the outer in length

1. Restio, Linn.

Sheaths of the stem deciduous, or if persistent then the inner segments of the male and female flowers distinctly exceeding the outer **2. Chondropetalum, Rottb.**

4. Styles 2 5

Style solitary or styles 3 11

5. Female flowers hidden by imbricate bracts, in compact spikelets; female spikelets with 1 or more sterile bracts beneath the lowermost fertile bract 6

Female flowers neither hidden by imbricate bracts nor in compact spikelets; female spikelets without a sterile bract beneath the lowermost fertile bract 10

6. Female spikelets 6- or more-flowered; female flowers much compressed **6. Staberoha, Kunth**

Female spikelets 1-, 2-, or several-flowered (not more than 5); female flowers obtusely trigonous, terete, or slightly compressed 7

7. Female spikelets with 2-5 perfect flowers, rarely by abortion with 1 perfect flower in one species; fruit compressed, semi-terete or terete, flattened or with a longitudinal depression on its adaxial side **9. Cannomois, Beauv.**

Female spikelets with 1 perfect flower, rarely with 2 perfect flowers (in one species), but then with the ovary tubercled on its upper parts; fruit terete 8

8. Male flowers produced in compact or rarely lax spikelets 9

Male flowers produced in racemes and panicles **10. Willdenowia, Thunb.**

9. Stems simple **8. Hypodiscus, Nees**

Stems repeatedly branched **7. Hypolæna, R. Br.**

10. Male and female inflorescences with a solitary spathe; spikelets solitary, terminal on the stems or on short lateral branchlets; perianth-segments equal in length **11. Anthochortus, Nees**

Male and female inflorescences with more than 1 spathe; spikelets neither solitary nor terminal on the stems; perianth-segments unequal in length **3. Elegia, Linn.**

11. Style solitary 5. *Thamnochortus*, Berg.
 Styles 3 12
 12. Female spikelets without a sterile bract beneath the lowermost
 fertile bract 3. *Elegia*, Linn.
 Female spikelets with 1 or more sterile bracts beneath the lowermost
 fertile bract 13
 13. Flowering stems branched; male spikelets erect, mostly ovate or
 oblong 4. *Leptocarpus*, R. Br.
 Flowering stems unbranched; male spikelets usually nodding,
 mostly turbinate or semi-orbicular 6. *Staberoha*, Kunth

804

1. RESTIO, Linn.

Plants dioecious, rarely monoecious. *Male spikelets* usually many, in panicle or spicate cymes, occasionally solitary and terminal, ovate, obovate, oblong, elliptic, or rotundate in outline, terete or occasionally somewhat compressed, usually many-flowered, rarely few-flowered, each with a spathe or sheath at its base; bracts usually many and imbricate, most or only a few fertile. *Perianth* of 6, or of 4, segments in 2 series, usually compressed, sometimes 3-sided; segments generally unequal, rigid or membranous; the outer-lateral conduplicate, boat-shaped, often villous-carinate; the anterior segment flattened or rounded; inner segments usually smaller, thinner and flattened. *Anthers* oblong, apiculate or mucicous. *Rudimentary ovary* with 2 or 3 minute styles, or absent. *Female spikelets* many, in panicle or spicate cymes, or solitary and terminal, like or unlike the male, many-, few-, or 1-flowered. *Perianth* as in the male but usually larger; inner segments often becoming tough with the development of the fruit. *Staminodes* generally 3, or absent. *Ovary* ovate, obovate, oblong or rotundate in outline, compressed or 3-sided, 2-, 3- (or by abortion 1-) chambered; styles 2 or 3, adjacent or remote, free or united in their lower parts. *Fruit* capsular, compressed, 3-sided or 3-lobed, 2-, 3- (or by abortion 1-) seeded. *Seed* tubercled or tessellate.

Flowering stems tufted or arising from a creeping rootstock, clothed at the base with clasping sheaths, erect or rarely reclining, terete, compressed or 4-sided, branched or simple; leaf-sheaths persistent, usually closely embracing the stem and more or less mucronate or aristate, rarely prolonged into a foliaceous mucro; sterile stems often present, shorter, more slender and more branched than the fertile.

Species about 110, natives of South Africa and Australia; about 80 are indigenous to South Africa, confined mostly to the south-western districts of the Cape Province.

805

2. CHONDROPETALUM, Rottb.

(*Askidiosperma*, Steud., *Dovea*, Kunth)

Plants dioecious. *Male spikelets* many, in panicle or cymes, oblong, ovate, or orbicular in outline, few- or many-flowered, usually somewhat compressed, with few or no sterile bracts. *Perianth* more or less trigonous or compressed, often somewhat arcuate, usually much longer than the subtending bract; segments 6, in two series; the outer lateral navicular, mostly carinate, glabrous or villous on the carina; the inner oblong or lanceolate, dorsally rounded, distinctly longer than the outer. *Anthers* ovate-oblong, with a prominent apiculus. *Rudimentary ovary* with 2 or 3 minute styles. *Female spikelets* resembling the male, generally in a shorter and more crowded inflorescence and with fewer flowers. *Perianth* trigonous or occasionally compressed; segments 6, resembling those in the male; the inner usually much longer than the outer, often equal, in one species the outer exceed the inner. *Staminodes* strap-shaped. *Ovary* trigonous, 3-lobed or compressed,

3- (or by abortion 2-) chambered. *Styles* 2 or 3, free. *Fruit* capsular, trigonous, 3-lobed or compressed, 3-, 2- (or by abortion 1-) seeded. *Seed* smooth or ribbed.

Flowering stems tufted or on a creeping rootstock, erect, simple or branched, terete, clothed at the base with crowded, dark-coloured sheaths; upper sheaths deciduous or persistent; adult sterile stems seldom present; female inflorescence often with persistent or sub-persistent conspicuous spathes.

Endemic; species about 16, extending from the Clanwilliam to the Albany district.

807

3. ELEGIA, Linn.

(*Lamprocarulos*, Mast.)

Plants dioecious. *Male spikelets* many or few, in panicle cymes, oblong, ovate or orbicular in outline, few- or many-flowered, with few or no sterile bracts. *Perianth* trigonous or sub-terete, often arcuate; segments 6; the inner longer than the outer. *Anthers* ovate-oblong, shortly apiculate. *Rudimentary ovary* with 2 or 3 minute styles or absent. *Female spikelets* many, in panicle cymes, or few in spicate cymes hidden by the spathes, few- or 1-flowered, usually without sterile bracts. *Perianth* ovate or oblong, trigonous or sub-terete; segments equal or unequal; the outer lateral often carinate. *Staminodes* minute or absent. *Ovary* trigonous, sub-terete, or compressed, 1-chambered; styles 2 or 3, distinct or rarely united in the lower half. *Fruit* 2- or 3-angled, occasionally keeled on the angles, indehiscent.

Flowering stems tufted or arising from creeping rhizomes, erect, simple or branched, terete, sometimes fistular, with deciduous or persistent leaf-sheaths; much-branched sterile stems occur in some species.

Endemic; about 25 species, extending from the Clanwilliam to the Stutterheim district.

808

4. LEPTOCARPUS, R.Br.

Plants dioecious. *Male spikelets* many, in panicle cymes, few in spicate cymes, or solitary and terminal, ovate, obovate, oblong, lanceolate, or cuneate in outline, many-flowered. *Perianth* compressed; segments 6; the outer lateral usually navicular, more or less villous on the midrib or glabrous. *Rudimentary ovary* with 3 minute styles, or absent. *Female spikelets* resembling the male, many-, several- (or by abortion 1-) flowered. *Perianth* as in the male or sub-trigonous. *Staminodes* minute or absent. *Ovary* usually trigonous, rarely compressed, 1-chambered; styles 3, free or united in their lower parts, rarely united to above the middle. *Fruit* trigonous, elliptic or ovoid, indehiscent.

Flowering stems tufted or arising sporadically from creeping rhizomes, erect, branched from below the middle upwards, rarely simple, terete; leaf-sheaths closely convolute or occasionally loose in their upper parts, persistent; much-branched shorter sterile stems often present.

Species about 30; several occur in tropical and south-west Australia; isolated species occur in Tasmania, New Zealand, Chili, and Cochin China; 12 species in South Africa, extending from Little Namaqualand to Natal.

813

5. THAMNOCHORTUS, Berg.

Plants dioecious. *Male spikelets* many, in panicle cymes, often declinate, usually oblong in outline, many-flowered. *Perianth* compressed; segments 6; the outer-lateral navicular, keeled along the midrib, generally longer than the inner. *Anthers* oblong, tapered above the middle into an apiculus. *Rudimentary ovary* 1-styled, or absent. *Female spikelets* many, in panicle

cymes, few in spicate cymes, or solitary and terminal, erect, larger than the male, many-flowered, with few sterile bracts. *Perianth* sub-trigonus or compressed; segments 6; the outer-lateral navicular, keeled or winged along the midrib. *Staminodes* tongue-shaped and short, or absent. *Ovary* compressed or sub-trigonus, 1-chambered; style solitary, simple. *Fruit* sub-trigonus or compressed, indehiscent.

Flowering stems tufted or on creeping rhizomes, erect, simple or with fertile or sterile branches, terete; leaf-sheaths closely convolute or loose in parts, persistent; much-branched shorter and more slender sterile stems often present.

Endemic; about 24 species, mostly in the south-western districts of the Cape Province, but extending on the north to Clanwilliam and eastwards to the Uitenhage district.

814

6. STABEROHA, Kunth

Plants dioecious. *Male spikelets* several or many in paniced cymes, occasionally solitary and terminal, often spreading or nodding, obovate, oblong, or sub-orbicular in outline, or turbinate, terete, compact, many-flowered. *Perianth* compressed; segments 6, equal or sub-equal; the outer-lateral navicular, keeled. *Anthers* oblong, apiculate. *Rudimentary ovary* minute. *Female spikelets* erect, solitary and terminal, geminate, or several in spicate cymes or occasionally in panicles, lanceolate or oblong in outline, many-flowered. *Perianth* compressed; segments 6; the outer lateral navicular, keeled or amply winged along the midrib. *Staminodes* minute. *Ovary* compressed, 1-chambered; styles 2 or 3, free, or 2 united at the base. *Fruit* compressed, indehiscent.

Flowering stems tufted or on creeping rhizomes, erect, simple, terete; leaf-sheaths closely convolute, persistent; much-branched shorter sterile stems often present.

Endemic; species 4, extending from Clanwilliam to Mossel Bay.

815

7. HYPOLÆNA, R.Br.

Plants dioecious. *Male spikelets* few or many, in spicate or paniced cymes, 1 to many-flowered. *Perianth* compressed, sub-terete or trigonus; segments 6, sometimes imperfectly developed or absent. *Anthers* oblong, spiculate. *Rudimentary ovary* minute. *Female spikelets* solitary, or several in a spicate cyme, terete, with several sterile bracts, with one perfect flower. *Perianth* stipitate, or in one species sessile, terete; segments 6; the inner sometimes imperfectly developed, or only the 3 outer present. *Staminodes* minute or absent. *Ovary* oblong in outline, terete or slightly compressed, often with a hard cap, 1-chambered; styles 2, free or united in their lower parts. *Fruit* oblong or elliptic in outline, terete, indehiscent.

Flowering stems tufted or less often arising from creeping rhizomes, erect or occasionally reclining, branched, terete or compressed; leaf-sheaths persistent, rarely prolonged into a foliaceous mucro.

Species about 14, found in South Africa, Australia, and New Zealand; 6 species native in South Africa, extending from the Cape districts to Willowmore; 1 species recorded from British Central Africa.

816

8. HYPODISCUS, Nees

Plants dioecious. *Male spikelets* few or many, in spicate or paniced cymes, occasionally terminal and solitary, compact or lax, each subtended by a rather conspicuous deciduous spathe, often with awned bracts, many-flowered. *Perianth* usually much compressed; segments 6 or the inner series absent; the outer-lateral mostly navicular and conduplicate. *Anthers* oblong, apiculate. *Rudimentary ovary* 2-styled. *Female spikelets* few, or sometimes many, in spicate or paniced cymes, rarely solitary, compact,

each subtended by rather conspicuous usually persistent spathe, 1-flowered; with many sterile bracts below the flower. *Perianth* sessile or stipitate; terete; segments 6 or fewer, or absent. *Staminodes* minute. *Ovary* usually stipitate, oblong in outline, terete, often topped by a toothed or lobed disc, 1-chambered; styles 2, deciduous, free or united in their lower parts. *Fruit* stipitate or sessile, barrel-shaped or rotundate, smooth, tessellate or tubercled on the sides or at the apex, indehiscent.

Flowering stems tufted or closely set along creeping rhizomes, erect, terete or compressed, simple; leaf-sheaths persistent, often on the upper parts of the stem, closely convolute; sterile stems usually few, or absent.

Endemic; species about 10, chiefly in the south-western districts of the Cape Province, but extending from Little Namaqualand to the Uitenhage district.

817

9. CANNOMOIS, Beauv.

Plants dioecious. *Male spikelets* many, in panicle cymes, oblong, ovate or orbicular in outline, compact, many-flowered. *Perianth* compressed; segments 6; the outer lateral navicular. *Anthers* oblong or elliptic, apiculate or mucous. *Rudimentary ovary* minute or absent. *Female spikelets* terminal and solitary, geminate, or few, or many in spicate cymes, at first usually oblong in outline, becoming ovate, acuminate, terete, 1-5-flowered, with few sterile bracts, rarely perfecting more than two fruits, each subtended by a persistent spathe. *Perianth* obscure during the flowering period, clasping the ovary; segments 6, usually enlarging with the development of the fruit to which they are closely adpressed, dorsally rounded or flattened. *Staminodes* minute or absent. *Ovary* oblong in outline, somewhat compressed, 1-chambered, often with a hard cap; styles 2, deciduous, free, attenuate. *Fruit* more or less stipitate, oblong, ovate-oblong, or obovate in outline, obtuse at the apex, terete, sub-terete, or compressed, flattened or with a longitudinal depression on the adaxial side, smooth or rugulose, glabrous or setaceo-pubescent, woody, indehiscent.

Flowering stems along creeping rhizomes, less often tufted, erect, terete, branched or simple; leaf-sheaths persistent, closely convolute; male inflorescence usually with several conspicuous deciduous spathes; sterile stems few or absent.

Endemic; species 7, extending from the Van Rhynsdorp to the Albany district.

818

10. WILLDENOWIA, Thunb.

(Ceratocaryum, Nees)

Plants dioecious. *Male flowers* many, in panicle racemes, each subtended by a deciduous linear or setaceous bract; perianth-segments 6, linear or setaceous, papery or membranous; the outer distinctly longer than the inner. *Anthers* oblong, apiculate. *Rudimentary ovary* minute. *Female spikelets* 1 to several, in spicate cymes, each subtended by a conspicuous persistent spathe, oblong, 1- or rarely 2-flowered, with several imbricate sterile bracts below the flower. *Perianth* sessile, or on a short fleshy stalk, terete, clasping the ovary; segments 6, fewer or absent, usually unequal. *Staminodes* tongue-shaped, minute. *Ovary* sessile or stipitate, oblong in outline, or globose, usually surmounted by a hard cap, 1-chambered; styles 2, free or rarely shortly united. *Fruit* barrel-shaped, ovate in outline, or globose, terete, usually pitted, sometimes tubercled, bony, indehiscent.

Flowering stems arising from creeping rhizomes or tufted, erect, branched or simple, terete; leaf-sheaths persistent, closely convolute; male inflorescence with conspicuous deciduous spathes; sterile stems few or absent.

Endemic; species about 12, chiefly confined to the south-western districts of the Cape Province.

818a

11. ANTHOCHORTUS, Nees

Plants dioecious. *Male spikelets* solitary and terminal, or on lateral branchlets, linear in outline, laxly 2-4-flowered, with deciduous bracts. *Perianth* sub-terete; segments 6, membranous, equal; the outer-lateral navicular. *Anthers* linear, apiculate. *Rudimentary ovary* absent. *Female spikelets* solitary and terminal or on lateral branchlets, containing 1 lower fertile bract with a perfect flower and 1 upper bract with a rudimentary flower. *Perianth* oblong, terete; segments 6, membranous, equal. *Staminodes* tongue-shaped. *Ovary* obovate, 1-chambered; styles 2, united at the base, diverging upwards. *Fruit* oblong in outline, indehiscent.

Flowering stems tufted, erect, sparingly branched, slender, terete or sub-quadrate, sulcate-striate; leaf-sheaths persistent, loosely convolute.

Endemic; species 1, recorded from the Paarl, Swellendam, and Riversdale districts.

818b

12. PHYLLOCOMOS, Mast.

Flowers bisexual,* hidden by the bracts. *Perianth* oblong, terete; segments 6, dorsally rounded or the outer-lateral somewhat angled, glabrous, sub-equal. *Anthers* linear, falling as the fruit develops. *Ovary* narrowly-ovate in outline, 1-chambered; styles 2, free. *Fruit* smooth or slightly rough at the apex, indehiscent.

Flowering stems arising from creeping rhizomes, erect, slender, terete, obscurely sulcate, scabrid, sparingly branched; leaf-sheaths persistent, closely convolute, aristate, with broad hyaline-membranous margins; inflorescence containing a terminal, occasionally also a lateral, tuft of pedunculate 1-flowered spikelets; bracts many, erect-spreading, aristate, membranous, pale.

Endemic; species 1, recorded from Mitchell's Pass in the Ceres district.

19. MAYACACEÆ.

Flowers bisexual, regular. *Perianth-segments* in 2 rows of 3 each; the 3 outer calyx-like, sub-valvate or very narrowly imbricate; the 3 inner petal-like, sub-equal, spreading, obovate or sub-orbicular, broadly imbricate. *Stamens* 3, hypogynous; filaments short, erect; anthers erect, basifixed, oblong, sub-4-angled. *Ovary* superior, sessile, with a broad base, 1-chambered, with many ovules in 2 rows; placentas 3, parietal; style filiform, undivided; stigma small, terminal, entire (or very shortly 3-fid?). *Capsule* surrounded by the long persistent outer perianth-segments and stamens, ovoid, with a membranous pericarp, more or less distinctly dehiscent. *Seeds* ovoid or globose; endosperm starchy (or somewhat fleshy?).

Slender aquatic or marsh herbs, also found in damp places; leaves shortly linear-filiform; flowers pedicelled, solitary and axillary, or several crowded at the apex of the branches.

Genus 1; species 7, natives of North and South America; 1 species in South Africa, recorded from S.W. Africa.

825

1. MAYACA, Aubl.

Characters and distribution of the family.

* Masters, in his original description of the genus, states that the flowers are unisexual.

20. XYRIDACEÆ.

Flowers bisexual. *Sepals* 3, or rarely 2; the two lateral exterior, boat-shaped, glumaceous; the third interior, membranous, convolute. *Corolla* regular, 3-lobed, coloured, with a slender tube, usually split into claw-like segments; lobes spreading, maerescent. *Stamens* 3, attached to the mouth of the corolla-tube opposite the lobes; staminodes 3 or 0, when present simple or bifid, with glabrous or hairy arms or more or less deeply divided into brush-like tufts of hairs. *Ovary* superior, 1-chambered or imperfectly 3-chambered; placentas 3, parietal or free and erect from the base, with numerous ovules; style filiform, sometimes with tubercles or proecesses at or below the middle, entire, 3-fid or 3-armed at the apex; stigmas dilated or sub-capitate; rarely simple. *Capsule* dividing into 3 valves between the placentas. *Seeds* minute, with copious endosperm.

Perennial or rarely annual herbs of tufted habit, growing in damp places; leaves radical, linear, terete, or filiform, sheathing at the base; peduncles erect, simple, terminated by a solitary dense head or spike, leafless or bearing one or more pairs of convolute sheaths; flower-heads or spikes globose, ovoid, or elongate; bracts glumaceous with a solitary flower in the axil of each.

Genera 2; species about 130, dispersed throughout the tropics and warmer regions of the earth.

826

1. XYRIS, Linn.

Sepals 3; two lateral and exterior, boat-shaped, keeled; one interior membranous, convolute or obtusely calyptriform, closely enveloping the corolla when in bud, circumscissile at the base, deciduous as the corolla develops. *Corolla* with a slender tube and 3 spreading euneate-obovate lobes. *Staminodes* 3, simple, bifid, or 2-armed, glabrous or penicellate. *Style* without tubercles or processes, 3-branched above; stigmas dilated or sub-capitate.

Peduncles with a basal sheath, naked above, otherwise as in the Family.

Species about 180, in tropical and warmer regions of the earth; 8 species in South Africa, extending from the Transvaal and Natal through the coastal districts into Namaqualand and S.W. Africa.

21. ERIOCAULACEÆ.

Flowers very small, regular or irregular, unisexual. *Calyx* of 2-3 free or variously connate searious or sub-membranous sepals, often ciliate and more or less hairy on the back near the apex, very rarely wanting. *Corolla* usually separated from the calyx by a distinct stipe; petals 2-3, free or variously connate, equal or unequal, sometimes rudimentary or absent, membranous and hyaline, or moderately thick and opaque, with or without a gland on their inner face, often ciliate or hairy. *Stamens* equal in number to the petals and inserted on them, or 4 or 6 (or by abortion fewer) in 2 series. *Staminodes* sometimes present in the female flowers and then minute. *Ovary* in male flowers rudimentary, reduced to 2-3 minute glands. *Ovary* superior, 2-3-chambered, with a solitary pendulous ovule in each chamber; style divided, with 3 simple or bifid filiform branches, with or without 3 other branches or appendages alternating with them or arising from the style below them. *Fruit* a 2-3-locular capsule. *Seed* solitary, pendulous; endosperm firm.

Perennial or annual herbs, growing in water, swamps, bogs, or on dry ground, stemless or with simple or branched leafy stems; leaves linear or subulate, alternate, arranged in a dense or lax rosette or scattered along the stem; inflorescence a head; heads usually bearing both male and female flowers, rarely flowers of one sex only.

Genera 6; species about 350, found in all warm climates; most numerous in tropical America, very few in the temperate regions.

1. Stamens double the number of the petals, in two alternating series; style-branches 3, without alternating appendages 2
Stamens equalling the number of petals, in one series; style-branches 6 3. *Pæpalanthus*, Mart.
2. Petals free, sometimes rudimentary, or rarely absent 1. *Eriocaulon*, Linn.
Petals connate into a cylindric tube, but with free claws in the female flower 2. *Mesanthemum*, Kornicke

828

1. ERIOCAULON, Linn.

Male flowers: *Sepals* 2-3, variously connate, bearded, ciliated, or glabrous at the apex. *Petals* 2-3, free, sometimes rudimentary or absent, usually with a gland and often hairy on their inner face, often ciliate or bearded at the apex. *Stamens* in two series, double the number of petals or by abortion fewer. *Female flowers*: *Sepals* 2-3, free, otherwise as in the male. *Petals* as in the male, rarely rudimentary or absent. *Staminodes* 0. *Ovary* 2-3-chambered; style-branches 3, simple, without alternating appendages.

Marsh or aquatic herbs, usually stemless, often caespitose with the leaves all radical, or in a few species with a simple or branched leafy stem; scapes 1-headed, longer than the leaves.

Species over 200; in all warm countries; 7 species in South Africa, mostly eastern into Natal; also recorded from Somerset East and the Transvaal.

829

2. MESANTHEMUM, Kornicke

Male flowers: *Sepals* 3, free or shortly connate at the base, hyaline. *Petals* united into an entire cylindric tube, sub-truncate or shortly 3-lobed at the apex, with 3 glands on the inside near the top of the tube. *Stamens* 6, in two alternating series, included within the corolla-tube. *Female flowers*: *Sepals* 3, free. *Petals* as in the male, but the perianth-tube divided at the base into 3 short claws. *Ovary* 3-chambered; style 3-branched; branches simple and filiform, or more or less enlarged and ramified near their apex, without alternating appendages.

Marsh herbs, stemless, or with a more or less elongating and rooting stem; leaves broadly linear, in a dense tuft; scape 1-headed, longer than the leaves; heads bearing flowers of both sexes.

Species 3, natives of tropical Africa and Madagascar; one species south of the tropic in West Africa.

830

3. PÆPALANTHUS, Mart.

Male flowers: *Sepals* 2-3, free or rarely more or less connate. *Petals* 2-3, connate into a campanulate or funnel-shaped tube, sub-truncate or shortly (rarely deeply) bifid or trifid at the apex. *Stamens* 2 or 3, of the same number as the petals and opposite to them, free or adhering to the corolla-tube. *Female flowers*: *Sepals* as in the male. *Petals* 2 or 3, free or connate at the middle or upper part, with free claws. *Ovary* 2-3-chambered; style divided above into 2-3 simple or bifid filiform branches, with 2-3 other branches or appendages alternating with them, or arising from the style below them.

Marsh, bog, aquatic, or terrestrial annual herbs, stemless or with simple or branched leafy stems; leaves linear or subulate; scapes usually 1-headed.

Species between 200-300, mostly tropical American; 3 or 4 species occur in tropical Africa; 1 species recorded from the Waterberg and Pretoria districts of the Transvaal.

22. COMMELINACEÆ.

Flowers bisexual, or the upper part of the cyme male. *Sepals* 3; uppermost one exterior, hooded. *Petals* 3, blue, yellow, or white, free, or clawed and with the claws united into a linear tube. *Stamens* 6, either all fertile or 1-4 often barren; filaments glabrous, or bearded with beaded hairs. *Ovary* superior, 3- or 2-chambered, with one to several ovules in each chamber; style simple. *Fruit* a loculicidal capsula. *Seed* often reticulate or rugose; embryo small, cylindric, loose in the fleshy endosperm.

Herbs, erect or prostrate; leaves alternate, with sheathing bases; inflorescence various.

Genera about 26; species about 330, found in all warm countries.

Tribe **Commelineæ**: Sterile stamens present; flowers zygomorphic (genera 1-2).

Tribe **Tradescantieæ**: Stamens all fertile; flowers actinomorphic (genera 3-5).

- | | |
|--|---|
| 1. One or more of the stamens barren | 2 |
| All the stamens fertile | 3 |
| 2. Flowers 1-2, included within a folded or funnel-shaped spathe | |

1. **Commelina**, Linn.

Flowers panicled or clustered, not surrounded by a spathe

2. **Aneilema**, R.Br.

- | | |
|---|----------------------------|
| 3. Filaments bearded | 4 |
| Filaments not bearded | 5. Floscopa , Lour. |
| 4. Flowers axillary, piercing the base of the leaf-sheath | |

3. **Coleotrype**, C.B. Cl.

Flowers in dense axillary and terminal clusters . . . 4. **Cyanotis**, Don.

896

1. COMMELINA, Linn.

Petals clawed; two equal; the third exterior and smaller than the other 2. *Stamens* 6; three perfect and one with usually a larger anther than the other two; three sterile. *Ovary* 3-chambered; the 2 anterior chambers with 1-2 ovules; the dorsal chamber with 1 ovule, or empty, or suppressed. *Fruit* a loculicidal capsula. *Seed* ellipsoid or angled, reticulate, pitted or rugose.

Annual succulent plants; spathe an ovate leaf-like bract, simply folded, boat-like, or the lower margins connate so as to form an oblique funnel; inflorescence of 1-2 cymes included (or nearly so) within the spathe: the upper flowers of the upper cyme usually male.

Species about 150, in all warm countries; 10 species in South Africa, extending from Natal and the Transvaal to the Cape; also recorded from Somerset East to Bechuanaland in the central region.

899

2. ANEILEMA, R.Br.

Petals 3, clawed, sub-equal. *Stamens* 6, 2-3 fertile, 3 sterile. *Ovary* 2-3-chambered, with 1-5 ovules in each chamber. *Fruit* a loculicidal capsula, 1-5-seeded. *Seed* rugose or pitted.

Weak herbs, with ascending or erect stems; inflorescence a terminal panicle within a small concave bract, or flowers 2 together within the terminal bract.

Species about 100, distributed in tropical and warm temperate zones; 4 species in South Africa, extending from Natal and the northern Transvaal to Pondoland.

903

3. COLEOTRYPE, C.B. Cl.

Corolla 3-lobed ; tube linear, as long as the blue segments. *Stamens* 6, inserted towards the top of the corolla-tube, sub-equal, all fertile ; filaments bearded. *Ovary* 3-chambered, with 1-2 ovules in each chamber. *Fruit* a 3-angled capsule, hairy at the top. *Seed* 1 (rarely 2) in each loculus.

Branching herbs, creeping at the base ; leaves with a cylindric sheath ; flowers massed, axillary, piercing the base of the leaf-sheath.

Species 3 or 4 ; 1 in Natal, the others in Madagascar.

904

4. CYANOTIS, D. Don.

Petals 3, free at the insertion, then connate (more or less completely) into a cylindric tube, terminated by 3 round segments. *Stamens* 6, sub-equal, free or nearly free from the corolla, all fertile ; filaments bearded with beaded hairs. *Ovary* 3-chambered, with 2 ovules in each chamber. *Fruit* a 3-valved capsule. *Seeds* 2 in each loculus.

Herbs, often weak, creeping or ascending, branching ; leaves various ; flowers in dense axillary and terminal clusters.

Species about 40, in the warm regions of the Old World from Africa to south China and north Australia ; 1 species in South Africa, extending from the Transvaal and Natal through the coastal belt to Riversdale ; also recorded from Queenstown.

908

5. FLOSCOPA, Lour.

Petals 3, free, obovate, sessile or scarcely clawed. *Stamens* 5-6, free, sub-equal or the 2-3 upper stamens rather smaller, all fertile ; filaments without beaded hairs. *Ovary* 2-chambered, with a single ovule in each chamber. *Fruit* a small membranous 2-valved capsule.

Stem simple or branched ; leaves rarely large ; inflorescence a dense terminal panicle.

Species about 21, in the warm regions of the world ; 7 species found in Africa of which 1 occurs in South Africa and recorded from the Transvaal and Natal.

23. PONTEDERIACEÆ.

Flowers bisexual. *Perianth* petaloid of 6 segments in 2 rows, united into a tube in the lower part, rarely free. *Stamens* 3 (in the South African species), or 6, rarely 1, usually of two sizes and often of different colours. *Ovary* superior, 3-chambered, with axile placentas, or 1-chambered with 3 parietal placentas, with numerous ovules, or rarely ovules solitary in each chamber ; stigma entire, thickened or sub-capitate, or shortly 3 lobed. *Fruit* a many-seeded capsule, or rarely a 1-seeded achene. *Seeds* small, ovoid, ribbed ; embryo cylindric, straight, embedded in the centre of a copious endosperm.

Aquatic or marsh herbs, with the lower part of the stem or rhizome creeping and rooting in the mud, or entirely floating ; leaves alternate, variously shaped, usually with a sheathing petiole ; inflorescence terminal, either fascicled in the sheath of the flowering leaf, or spicate with the flowers solitary or fascicled along the axis of the spike, rarely solitary and axillary.

Genera 6 ; species about 22, chiefly natives of tropical Africa and tropical America ; 1 species found in Australia.

924

HETERANTHERA, Ruiz. & Pav.

Perianth with a distinct tube ; segments equal, spreading, oblong. *Stamens* 3, attached to the throat of the perianth-tube, exserted, more or less unequal. *Ovary* 1-chambered, with 3 parietal placentas, or imperfectly 3-chambered with very prominent placentas, with numerous ovules in each chamber; style filiform ; stigma thickened. *Capsule* oblong or linear. *Seeds* numerous, ovoid, ribbed.

Lower part of stem creeping and rooting in the mud ; leaves with long petioles sheathing at the base ; flowering-shoots bearing one leaf, whose sheath embraces the membranous spathe which subtends the terminal flower-spike or includes 1-3 flowers ; inflorescence spicate, with the flowers all alike or one or more cleistogamous.

Species 9 ; natives of tropical Africa and America ; 1 species found in the Transvaal Bushveld.

24. JUNCACEÆ.

Flowers regular (bisexual in the South African genera). *Perianth* of 6 sub-equal glumaceous segments in 2 rows. *Stamens* usually 6, hypogynous or attached to the base of the segments ; filaments filiform or flattened. *Ovary* superior, 1-3-chambered, with usually many ovules in each chamber ; style filiform, simple or trifurcate. *Fruit* capsular, splitting into 3 valves. *Seeds* ovoid, globose or angled by pressure, rarely compressed ; endosperm copious ; embryo small.

Perennial or annual herbs, rarely shrubs ; stem often leafy only at the base ; leaves terete or linear ; flowers small, often clustered ; bracts scarious, persistent. Genera 7 ; species about 200 ; cosmopolitan.

1. Ovary 1-chambered ; leaves radical, ciliate with long soft hairs 3. *Luzula*, DC.
 Ovary completely or incompletely 3-chambered ; leaves radical or
 in a terminal rosette, glabrous or serrated 2
2. Leaves reduced to sheaths, or if developed not serrated ; style divided
 to the middle into 3 linear or filiform spreading stigmas 2. *Juncus*, Linn.
 Leaves in a dense terminal rosette ; stigmas 3, sessile 1. *Prionium*, E. Mey.

930

1. PRIONIUM, E.Mey.

Perianth rigid ; segments ovate. *Stamens* 6, as long as the perianth-segments. *Ovary* sessile, globose, 3-chambered, with usually 2 axile ovules in each chamber ; stigmas 3, sessile, spreading. *Capsule* loculicidally 3-valved. *Seeds* usually 1 in each loculus, ovoid-oblong ; endosperm fleshy.

Stems thick ; leaves aggregated in a dense rosette at the top of the stem ; inflorescence a large dense terminal panicle on a long peduncle.

Endemic ; species 1, extending from Clanwilliam through the coastal districts to Natal.

936

2. JUNCUS, Linn.

Perianth rigid ; segments ovate or lanceolate. *Stamens* 6, rarely 3. *Ovary* sessile, more or less completely 3-chambered due to intruding parietal placentas ; style filiform, divided to the middle into 3 linear or filiform spreading stigmas. *Capsule* loculicidally 3-valved. *Seeds* very small, often tailed by the outer membrane of the testa being produced beyond the nucleus.

Perennial or annual herbs ; leaves various, terete or flat, sometimes reduced to membranous sheaths, glabrous ; inflorescence terminal or apparently lateral, laxly paniced or congested into a head ; perianth usually brown.

Species about 250, cosmopolitan ; about 31 species in South Africa, extending from Little Namaqualand to Natal and the Transvaal ; also widely spread in the central districts.

937

3. LUZULA, DC.

Perianth rigid ; segments ovate. *Stamens* 6, shorter than the perianth. *Ovary* sessile, 1-chambered, with 3 ovules arising from a short basal placenta ; style filiform, trifurcate. *Capsule* 3-valved. *Seeds* 3 or fewer, erect, sub-globose, or angled by pressure on the inner side, minutely striatcd.

Densely-tufted perennial herbs ; leaves grass-like, mostly radical, ciliate with soft hairs ; inflorescence laxly or densely paniced, terminal ; perianth brown, yellow, or white.

Species about 70, cosmopolitan ; 1 species in South Africa, recorded from Natal, the Mont-Aux-Sources, Katberg, and Cathcart.

25. LILIACEÆ.

Flowers bisexual, rarely unisexual, regular or nearly so. *Perianth* corolline, of 6 free segments, or segments joined to form a long or short tube. *Stamens* 6, in 1-2 series, opposite the perianth-segments, hypogynous, or inserted on the perianth-tube, or in the perianth-throat ; filaments free or more or less united at the base ; anthers usually dorsifixed, with introrse or extrorse dehiscence. *Ovary* superior, 3-chambered, with 1-2 to many ovules in each chamber ; styles 3, distinct, or style 1 ; stigmas mostly small. *Fruit* a capsule or berry. *Seed* globose, discoid or angled by pressure, sometimes winged, rarely hairy ; embryo small ; endosperm copious, mostly horny.

Plants usually stemless, sometimes shrubby, or arborescent, or climbing, with usually a bulb, more rarely a corm, tuber, or rhizome, with fleshy or fibrous roots ; leaves various, sometimes appearing after the flowers, mostly radical, sometimes thick and succulent, sometimes produced at the apex into a tendril, or reduced to small scales and with the stems modified to form cladodes ; inflorescence a raceme, panicle, corymb, or spike, more rarely a head, or umbel.

Genera over 200 with more than 2,000 species, widely distributed.

Series I. Anthers dehiscing extrorsely, very rarely introrsely or by terminal pores.

Tribe **Uvulariæ** : Rootstock tuberous ; capsule with loculicidal dehiscence (genera 1-3).

Tribe **Anguillaræ** : Underground stem a corm ; perianth-segments narrowed into a distinct claw (genera 4-10).

Series II. Liliaceæ verac : Anthers with introrse dehiscence ; fruit a capsule, with loculicidal dehiscence.

Tribe **Asphodeleæ** : Underground stem rarely a bulb or tuber ; inflorescence racemose ; perianth-segments free or nearly so ; leaves not succulent. (genera 11-20).

Tribe **Aloïneæ** : Underground stem never a bulb ; inflorescence racemose ; perianth-segments more or less united to form a tube at the base ; leaves mostly succulent (genera 21-27).

Tribe **Alliæ** : Plants with a root-stock or bulb ; inflorescence a pseudo-umbel, subtended by a spathe formed of 1 or 2 or even more membranous bracts (genera 28-30, 50-52).

Tribe **Scilleæ** : Underground stem a bulb ; inflorescence a raceme or spike. (genera 31-49).

Series III. Asparagoideæ : Anthers dehiscing introrsely ; fruit baccate.

Tribe **Dracænæ** : Leaves foliaceous and expanded ; stem woody and shrubby ; leaves herbaceous (genus 53).

Tribe **Ophiopogonæ** : Leaves foliaceous and expanded ; stemless ; rootstock with fleshy roots ; leaves leathery or horny ; berries yellow (genus 54).

Tribe **Asparagæ** : Leaves much reduced, with solitary or fasciated cladodes in their axils ; perianth-segments free (genus 55).

Tribe **Luzuriagæ** : Leaves foliaceous and expanded ; stems climbing ; inflorescence cymose ; flowers bisexual ; perianth-tube campanulate (genus 56).

Tribe **Smilacæ** : Leaves foliaceous and expanded ; stems climbing ; flowers unisexual ; inflorescence umbellate (genus 57).

1. Flowers unisexual ; leaves broad, flat, prominently 3-5-nerved from the base ; tendrils present **57. Smilax, Linn.**
Flowers bisexual, very rarely with some unisexual flowers present, but then stem divided into numerous pinnate branches ; leaves various 2
2. Styles 3, free 3
Style solitary, usually with a capitate or tricuspidate stigma ; rarely the 3 stigmas very distinct 9
3. Inflorescence a head, overtopped by the exterior bracts
4. Androcymbium, Willd.
Inflorescence a raceme or spike, or flowers solitary 4
4. Perianth-segments with a pair of nectariferous spots, auricles, or glandular foveoles at the base of the blade 5
Perianth-segments without any appendages 8
5. Perianth-tube present **8. Wurmbea, Thunb.**
Perianth-tube 0 6
6. Inflorescence a spike ; segments with a pair of nectariferous spots or auricles at the base of the blade 7
Inflorescence a raceme or corymb ; segments with 2 glandular foveoles at the base of the claw **9. Ornithoglossum, Salisb.**
7. Underground stem a bulb ; carpels diverging at the apex
7. Neodregea, C. H. Wright
Underground stem a corm ; carpels not diverging at the apex
6. Dipidax, Salisb.
8. Inflorescence a raceme, or flowers solitary ; perianth-segments with a long convolute claw **5. Bæometra, Salisb.**
Flowers inconspicuous, usually solitary in the axils of the upper leaves ; perianth-segments obscurely clawed **10. Iphigenia, Kunth**
9. Leaves with tendrils at their apices 10
Leaves without tendrils 11
10. Perianth-tube 0 ; segments spreading or reflexed ; inflorescence a few-flowered corymb **1. Gloriosa, Linn.**
Perianth-tube very short ; segments ascending ; flowers axillary, solitary **2. Littonia, Hook. fl.**
11. Inflorescence an umbel 12
Inflorescence a spike, raceme, panicle, cyme, or head, or flowers solitary 14
12. Corona in the throat of the perianth-tube **29. Tulbaghia, Linn.**
Perianth without a corona 13
13. Perianth-tube 0 ; 3 inner filaments tricuspidate **29. Allium, Linn.**
Perianth-tube present ; filaments not tricuspidate
27. Agapanthus, L'Her.
14. Plants with evident woody stems ; leaves never thick and fleshy ; fruit a berry 15
Plants not woody, if a woody stem produced then leaves thick and fleshy ; fruit a capsule 17
15. Perianth-tube 0 ; apparent leaves modified stems (phylloclades)
55. Asparagus, Linn.
Perianth-tube cylindric or funnel-shaped 16

16. Inflorescence a raceme or panicle; ovule solitary in each ovary chamber: **53. Dracæna**, *Linn.*
 Inflorescence a simple or compound cyme in the axils of the upper leaves; ovules few in each ovary chamber **56. Behnia**, *Didrichs.*
17. Filaments connate at the base 18
 Filaments free 23
18. Inflorescence a sessile or sub-sessile globose head, surrounded by a number of imbricated bracts 19
 Inflorescence a corymb or raceme 20
19. Filaments united into a cup at the base **50. Massonia**, *Thunb.*
 Filaments united into a tube as long as the perianth **51. Androsiphon**, *Schltr.*
20. Inflorescence a corymb; stamens in 2 rows **46. Polyxena**, *Kunth*
 Inflorescence a lax raceme, sometimes densely sub-spicate or head-like; stamens in 1 row 21
21. Perianth-segments longer than the tube; inflorescence a dense sub-spicate raceme **48. Whiteheadia**, *Harv.*
 Perianth-segments shorter than the tube; inflorescence a lax raceme, or a shortly peduncled raceme, or sometimes raceme head-like 22
22. Leaves linear **49. Neopatersonia**, *Schoul.*
 Leaves elliptic or ovate **47. Neobakeria**, *Schltr.*
23. Ovules 2 in each ovary chamber, more rarely only one 24
 Ovules several or many in each ovary chamber, rarely 2, but if so then seeds woolly 30
24. Perianth-tube cylindric 25
 Perianth-tube none or very short 26
25. Underground stem bulbous; stamens inserted at the middle of the perianth-tube **44. Veltheimia**, *Gleditsch.*
 Underground stem a rhizome; stamens inserted in the throat of the perianth-tube **54. Sansevieria**, *Thunb.*
26. Leaves in dense rosettes; flowers 1-3, on a short peduncle from the centre of the rosette of leaves **16. Nanolirion**, *Benth.*
 Inflorescence a panicle or raceme 27
27. Perianth spirally twisted when faded **15. Cæsia**, *R.Br.*
 Perianth, if persistent, not spirally twisted 28
28. Underground stem a bulb 29
 Plants with fleshy fascicled roots; bulbs absent **11. Bulbinella**, *Kunth*
29. Perianth-segments sub-equal; flowers usually blue or mauve **38. Scilla**, *Linn.*
 Three inner perianth-segments cucullate at the tip; flowers greenish white **41. Drimiopsis**, *Lindl.*
30. Filaments densely bearded **12. Bulbine**, *Linn.*
 Filaments glabrous 31
31. Inflorescence topped by a coma of leafy empty bracts **39. Eucomis**, *L'Her.*
 Inflorescence without a coma of bracts 32
32. Flowers solitary or 2-nate 33
 Inflorescence a raceme, panicle, corymb, or umbel 37
33. Perianth-tube globose, constricted at the mouth; segments shorter than the tube **3. Sandersonia**, *Hook. f.*
 Perianth-tube oblong, very short or none 34
34. Perianth-segments shorter than the tube **37. Litanthus**, *Harv.*
 Perianth-segments longer than the tube, or perianth-tube 0 35
35. Stem tall and voluble, with many pinnate branches **18. Bowia**, *Harv.*
 Stems simple or branched, but not pinnately branched 36
36. Stem leafy to the apex **2. Littonia**, *Hook. fil.*
 Leaves radical **17. Schizobasis**, *Baker*
37. Perianth-tube 0 38
 Perianth with a distinct tube 46
38. Underground stem a tuber, or rhizome, or plants with fleshy roots 39
 Underground stem a bulb 42

39. Inflorescence a dense spike **21. Notosceptrum**, *Benth.*
 Inflorescence a raceme, panicle, or corymb, or more rarely flowers
 solitary 40
40. Anthers dorsifixed; seeds hairy **19. Eriospermum**, *Jacq.*
 Anthers basifixed; seeds glabrous 41
41. Fruit deeply 3-lobed; seeds discoid **14. Chlorophytum**, *Ker*
 Fruit not distinctly lobed; seeds 3-angled **13. Anthericum**, *Linn.*
42. Stems climbing or erect **17. Schizobasis**, *Baker*
 Stems none; leaves and inflorescence arising from the bulb 43
43. Three inner perianth-segments connivent and differing from the
 three outer **31. Albuca**, *Linn.*
 Perianth-segments all equal or sub-equal 44
44. Seeds discoid, often winged; flowers whitish, with green or purple-
 brown keels; bracts often spurred **32. Urginea**, *Steinh.*
 Seeds globose or angled by pressure; flowers white, yellow, blue,
 or mauve-purple; bracts not spurred 45
45. Flowers generally blue or mauve-purple; filaments filiform or
 slightly flattened at the base, attached to the base of the perianth-
 segments **38. Scilla**, *Linn.*
 Flowers generally white or yellow; filaments usually more or less
 flattened, not attached to the base of the perianth-segments
40. Ornithogalum, *Linn.*
46. Underground stem not a bulb; stamens hypogynous, not attached
 to the perianth, if inserted on the perianth then with a solitary
 ovule in each ovary chamber 47
 Underground stem a bulb; stamens inserted on the perianth-tube or
 in the throat of the perianth; if hypogynous then leaves articu-
 lated above the dilated base 54
47. Stamens inserted in the perianth-throat; ovule solitary in each
 ovary chamber **54. Sansevieria**, *Thunb.*
 Stamens hypogynous; ovules many in each ovary chamber 48
48. Leaves not thick and fleshy 49
 Leaves thick and fleshy 51
49. Perianth-tube cylindric or funnel-shaped, longer than the segments
21. Kniphofia, *Moench.*
 Perianth-tube campanulate, short or almost obsolete, shorter or
 as long as the segments 50
50. Inflorescence a dense spike; stamens as long as the perianth
21. Notosceptrum, *Benth.*
 Inflorescence a raceme; stamens much shorter than the perianth
14. Liriothamnus, *Schltr.*
51. Perianth-tube curved, cylindric in the upper half, ventricose in the
 lower half; stamens about as long as the perianth; seeds winged
24. Gasteria, *Duval*
 Perianth-tube straight, cylindric or oblong-cylindric, or perianth
 2-lipped; stamens included or exserted 52
52. Perianth 2-lipped **26. Haworthia**, *Duval*
 Perianth not 2-lipped 53
53. Leaves usually in a basal rosette or in a rosette at the end of the
 branches, rarely with leafy stems, but then flowers reddish or
 yellow **23. Aloe**, *Linn.*
 Stems leafy; leaves short, thick, multifarious or quinquefarius;
 flowers usually whitish **25. Apicra**, *Willd.*
54. Leaves articulated above the dilated base; stamens hypogynous
27. Chortolirion, *Berger*
 Leaves not articulated; stamens inserted on the perianth 55
55. Inflorescence a head; the marginal flowers very prominently 2-lipped
52. Daubenya, *Endl.*
 Inflorescence a raceme, more rarely a spike or corymb; flowers not
 2-lipped 56

56. Perianth-segments dimorphic ; the 3 outer differing from the 3 . . . inner 57
 Perianth-segments equal or sub-equal 58
57. Perianth-tube oblong-cylindric ; outer segments reflexing, convolute, often longer than the inner 36. *Dipcadi*, *Medik.*
 Perianth-tube campanulate ; outer segments slightly gibbous near the apex ; the 3 inner usually longer 45. *Lachenalia*, *Jacq.*
58. Anthers connivent 35. *Rhadamanthus*, *Salisb.*
 Anthers not connivent 59
59. Leaves usually 2 ; inflorescence a corymb, with the peduncle more or less hidden by the leaves 46. *Polyxena*, *Kunth*
 Leaves usually more than 2 ; inflorescence a raceme ; peduncle evident 60
60. Perianth-segments falcate ; seeds globose 42. *Hyacinthus*, *Linn.*
 Perianth-segments not falcate ; seeds discoid or angled by pressure 61
61. Stamens inserted below the perianth-throat 33. *Galtonia*, *Dene.*
 Stamens inserted in the perianth-throat 62
62. Perianth-tube campanulate 34. *Drimia*, *Jacq.*
 Perianth-tube cylindric, slightly curved 43. *Pseudogaltonia*, *O. Kuntze*

963

1. GLORIOSA, Linn.

Perianth-tube 0 ; segments equal, clawed, spreading or reflexed, persistent. *Stamens* hypogynous ; filaments filiform ; anthers linear-oblong, versatile, introrsely attached, dehiscent extrorsely near the margin. *Ovary* sessile, oblong, with many ovules ; style filiform, trifurcate at the apex. *Fruit* coriaceous, septicidally 3-valved. *Seeds* globose, bright red ; endosperm firm.

Rootstock tuberous ; stem slender, usually elongated and scandent ; leaves sessile, with tendrils at the apex ; inflorescence corymbose ; flowers few, large, showy.

Species 5, found in Africa and tropical Asia ; 2 species in South Africa, extending from Natal and the Transvaal to the Bathurst district ; both species found in tropical Africa.

964

2. LITTONIA, Hook. f.

Perianth-tube very short ; segments equal, ascending. *Stamens* much shorter than the perianth ; filaments filiform ; anthers linear-oblong, versatile, introrsely attached near the base, extrorsely dehiscent. *Ovary* sessile, oblong, deeply 3-grooved, with many ovules ; style short, cylindric, with 3 falcate branches. *Fruit* coriaceous, septicidally 3-valved.

Rootstock tuberous ; stem simple or branched, leafy to the apex ; leaves produced into a tendril at the apex ; flowers solitary from the axils of the upper leaves.

Species about 7 ; 4 occur in tropical Africa, 2 in Arabia ; 1 species in South Africa, extending from East London to Natal and into the northern Transvaal ; also found in the eastern O.F.S.

965

3. SANDERSONIA, Hook. f.

Perianth-tube globose, constricted at the mouth, saecate at the base ; segments short, broadly ovate, shorter than the tube. *Stamens* much shorter than the perianth-tube ; filaments filiform ; anthers oblong, versatile, introrsely attached, dehiscent extrorsely. *Ovary* oblong, deeply 3-lobed, with many ovules ; style short, cylindric, trifid at the apex.

Rootstock tuberous ; stem leafy to the apex ; leaves sessile, alternate, linear or lanceolate ; flowers solitary in the axils of the upper leaves ; pedicels cernuous, without bracts.

Endemic ; species 1, extending from Zululand into Pondoland.

969

4. ANDROCYMBIUM, Willd.

Perianth-tube 0; segments sub-equal, with a distinct canaliculate claw and an acute lamina with incurved edges. *Stamens* inserted at the junction of the claw and lamina; filaments filiform, thickened towards the base; anthers oblong, versatile, dehiscing laterally. *Ovary* sessile, with many ovules; styles 3, distinct; stigmas minute. *Fruit* a septicidal capsule. *Seeds* globose; endosperm firm.

Underground stem an ovoid corm with membranous tunics; stem simple, short or 0; leaves crowded in the caulescent species; inflorescence a globose head, overtopped by the exterior bracts.

Species 30, mostly African, 1 species found in Palestine; 29 species in South Africa, chiefly in S.W. Africa and Namaqualand to Clanwilliam and the north-western districts; also in some central districts and extending to the Albany district; less frequent in the south-western districts, Natal, and the Transvaal.

970

5. BÆOMETRA, Salisb.

Perianth-tube 0; segments sub-equal, with a long convolute claw. *Stamens* inserted at the apex of the claw of the perianth-segments; filaments subulate, tapering upwards; anthers versatile, dehiscing along the margin. *Ovary* sessile, 3-angled, with many ovules; styles 3, short, spreading. *Fruit* 3-angled, septicidally 3-valved. *Seeds* globose, or angled by pressure, brown; endosperm cartilaginous.

Underground stem a corm; stems simple; leaves several; lower leaves lanceolate, clasping the stem, gradually reduced upwards; inflorescence a raceme, or flowers solitary.

Endemic; species 1, found from Clanwilliam to Riversdale.

971

6. DIPIDAX, Laws.

Perianth deciduous; tube 0; segments sub-equal, clawed, with a pair of nectariferous spots at the base of the blade. *Stamens* inserted on the claw of the perianth-segments; filaments subulate; anthers oblong, versatile, introrsely affixed, dehiscing along the margin extrorsely. *Ovary* sessile, 3-lobed, with many ovules; styles 3, subulate, falcate. *Fruit* turbinate, septicidally 3-valved. *Seeds* sub-globose, brown; endosperm firm.

Underground stem a tunicated corm; leaves generally 3, persistent; inflorescence a few- or many-flowered spike.

Endemic; species 3, found from Clanwilliam to Port Elizabeth.

971a

7. NEODREGEA, C.H. Wright

Perianth-tube 0; segments shortly clawed, with auricles just above the claw. *Filaments* filiform; anthers small, dorsifixed. *Ovary* deeply 3-lobed, with the carpels diverging at the apex, and with about 6 ovules in each ovary chamber. *Fruit* a loculicidal capsule. *Seeds* lenticular.

Underground stem a tunicated bulb; leaves cauline, alternate, sessile; inflorescence a lax terminal spike.

Endemic; species 1, recorded from Albany and Port Elizabeth.

972

8. WURMBEA, Thunb.

Perianth persistent; tube campanulate or cylindric; segments equal, spreading, with 2 glandular foveoles above the base. *Stamens* inserted at the base of the perianth-segments; filaments filiform; anthers oblong, versatile, introrsely affixed, dehiscing extrorsely near the margin. *Ovary* sessile, 3-lobed at the apex, with many ovules; styles free, subulate. *Fruit* globose, septicidally 3-valved. *Seeds* sub-globose, brown; endosperm firm.

Underground stem a tunicated corm; stem simple, with a few narrow leaves; inflorescence a spike; bracts 0.

Species about 7, in Africa and Australia; 2 species in South Africa, extending from Natal through the coastal districts to Clanwilliam; also recorded from Somerset East and Aliwal North.

973

9. ORNITHOGLOSSUM, Salisb.

Perianth persistent; tube 0; segments equal, spreading or reflexed, clawed, with a nectariferous foveole at the top of the convolute claw. *Stamens* inserted at the base of the segments; filaments filiform; anthers dorsifixed, versatile, dehiscing extrorsely near the margin. *Ovary* sessile, oblong, with many ovules; style 3, subulate. *Fruit* loculicidally 3-valved. *Seeds* sub-globose, fleshy; endosperm cartilaginous.

Underground stem a corm with a long neck; leaves about 6, clasping the stem at the base; inflorescence a corymb or raceme.

Species 1, widely distributed from Great Bushmanland to the Cape and over the central districts; also in the Transvaal, O.F.S., and Bechuanaland; also occurs in tropical Africa.

975

10. IPHIGENIA, Kunth

Perianth-tube 0; segments caducous, equal, spreading, obscurely clawed. *Stamens* shorter than the perianth-segments; filaments slightly or much thickened; anthers minute, versatile. *Ovary* sessile, with many ovules; styles 3, falcate. *Fruit* loculicidally 3-valved. *Seeds* sub-globose, brown, with a small appendage.

Underground stem a tunicated corm; stem producing few or many distant leaves; flowers inconspicuous, usually solitary in the axils of the upper leaves.

Species about 12, in tropical Asia, North America, and Africa; 4, probably 5, species in South Africa, found in S.W. Africa and in the Transvaal.

984

11. BULBINELLA, Kunth

Perianth-tube 0; segments sub-equal, 1-nerved. *Stamens* hypogynous or attached to the base of the perianth-segments; filaments filiform or slightly flattened; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* sessile, sub-globose, with 2 ovules in each chamber; style cylindric; stigma capitate. *Fruit* globose, dehiscing loculicidally. *Seeds* often solitary, black; endosperm fleshy.

Roots fleshy, fascicled; leaves radical, terete or flat; inflorescence a raceme; peduncle leafless; flowers whitish or yellow; pedicels articulated at the apex.

Species about 12, one species found in New Zealand and another in the Campbell and Auckland Islands; 9 species recorded from South Africa, extending from Little Namaqualand through the coastal districts to Natal and the Transvaal.

985

12. BULBINE, Linn.

Perianth-tube 0; segments sub-equal, 1-nerved, spreading or reflexed when fully expanded. *Stamens* hypogynous or fixed to the base of the perianth-segments, shorter than the segments; filaments densely bearded; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* globose, with 4 to many ovules in each ovary-chamber; style filiform; stigma capitate. *Fruit* globose or turbinate, membranous, loculicidally 3-valved. *Seeds* angled by pressure, black; endosperm fleshy.

Acaulescent or caulescent herbs; rootstock often tuberous; leaves fleshy, sub-terete, linear or lanceolate; inflorescence a raceme; pedicels articulated at the apex; bracts membranous, persistent; flowers usually bright yellow.

Species about 50; 2 in Australia, several in tropical Africa; 38 recorded from South Africa, widely distributed over the Union.

989

13. ANTHERICUM, Linn.

Perianth marcescent, not twisted after flowering; tube 0; segments spreading, sub-equal, 3-5-nerved on the keel. *Stamens* hypogynous or adnate to the very base of the segments; filaments filiform or slightly compressed; anthers basifixed, versatile, dehiscent introrsely. *Ovary* sessile, globose, with several ovules in each chamber; style subulate; stigma capitate. *Fruit* coriaceous, loculicidally 3-valved. *Seeds* 3-angled, black; embryo cylindric; endosperm firm.

Rootstock obscure; root-fibres wiry or cylindric; radical leaves usually linear or sub-terete; inflorescence a raceme or panicle; pedicels often 2-3-nate, articulated at the middle or apex; bracts small, scarious.

Species about 100, in Africa, Europe, and a few in America; 90 species described from South Africa; widely distributed over the Union.

989a

14. LIRIOTHAMNUS, Schltr.

Perianth with a short tube; segments sub-equal, narrow or linear-oblong, obtuse, uninerved, slightly spreading, glabrous. *Stamens* sub-erect, inserted at the base of the perianth; filaments subulate, slightly narrowed above, almost one-fourth as long as the perianth; anthers ovate-oblong, sub-acute, dorsifixed. *Ovary* ovoid, 3-angled, with 5-7 ovules in each chamber; style filiform, almost as long as the stamens; stigma simple. *Fruit* (mature) not seen.

A much branched plant; branches leafy all the way up and densely leafy at the apex; leaves erect-spreading, linear, falcate, acute, almost twice as short as the inflorescence, glabrous; inflorescence a raceme; flowers greenish-white; bracts membranous, lanceolate, very acute, slightly shorter than the pedicel.

Endemic; species 1, found in Namaqualand.

Note.—This is *Anthericum involucreatum*, Bkr. of the "Flora Capensis."

990

15. CHLOROPHYTUM, Ker

Perianth marcescent, persistent, not twisted after flowering; tube 0; segment sub-equal, spreading, 3-7 nerved. *Stamens* hypogynous or adnate to the base of the perianth-segments; filaments filiform, often dilated above the middle; anthers basifixed, dehiscent introrsely. *Ovary* sessile, ovoid, with several ovules in each chamber; style filiform; stigma capitate. *Fruit* deeply 3-lobed, acutely angled, loculicidally 3-valved. *Seeds* discoid, black; embryo cylindric; endosperm firm.

Rootstock very small; root-fibres wiry or fleshy; radical leaves linear and sessile, or broader and petioled; inflorescence a raceme or panicle; pedicels articulated.

Species about 150, natives of Africa, Asia, America, and Tasmania; 19 species recorded from South Africa, ranging from Little Namaqualand to Natal.

1002

16. CÆSIA, R.Br.

Perianth persistent, marcescent, spirally twisted when faded; perianth-tube very short; segments sub-equal, 3-nerved. *Stamens* attached to the base of the perianth-segments; filaments filiform; anthers dorsifixed, dehiscent introrsely. *Ovary* sessile, globose, with 2 ovules in each chamber; style filiform; stigma capitate. *Fruit* globose, loculicidally 3-valved. *Seed* 3-angled, solitary in the loculi, black, crustaceous, papillose; endosperm fleshy.

Rootstock obscure; leaves linear, grass-like; inflorescence a lax raceme or panicle; pedicels articulated at the apex, often 2-3-nate.

Species about 9, found in Australia, one species in Madagascar; 3 species recorded from South Africa, extending from Clanwilliam to Albany.

1005

17. NANOLIRION, Benth.

Perianth marcescent, spirally twisted after flowering; tube 0; segments sub-equal, obscurely 3-nerved. *Stamens* hypogynous, or the 3 inner attached to the base of the perianth-segments; filaments flattened; anthers dorsifixed, with introrse dehiscence. *Ovary* sessile, with 2 ovules in each chamber; style filiform; stigma capitate. *Fruit* sub-globose, loculicidally 3-valved.

A dwarf plant, with a slender creeping rhizome; leaves in dense rosettes, sub-terete; flowers 1-3 on a short peduncle from the centre of the rosette of leaves.

Endemic; species 1, only known from the Great Winterhoek in the Tulbagh district.

1010

18. SCHIZOBASIS, Baker

Perianth persistent, marcescent; tube 0; segments sub-equal, 1-nerved. *Stamens* attached to the base of the perianth-segments; filaments slightly flattened; anthers dorsifixed, versatile, dehiscent introrsely. *Ovary* sessile, with few ovules in each chamber; style cylindric; stigma 3-lobed. *Fruit* membranous, loculicidally 3-valved. *Seeds* 1-3 in each loculus, turgid, or angled by pressure, black; endosperm fleshy.

Underground stem a globose bulb with membranous tunics; stems climbing or erect; leaves radical; inflorescence a raceme or panicle, or flowers solitary; pedicels solitary, articulated at the apex.

Endemic; species 6, extending from S.W. Africa to the Transvaal; found also in the central districts and as far south as Somerset East; absent from the coastal belt; 1 species found in Angola.

1011

19. BOWIEA, Harv.

Flowers bisexual, with occasional unisexual flowers. *Perianth* marcescent; tube 0; segments reflexing. *Stamens* perigynous, much shorter than the perianth; filaments slightly flattened; anthers versatile, dehiscent introrsely. *Ovary* sessile, ovoid, with numerous ovules; style short, cylindric; stigma obscurely 3-lobed. *Fruit* membranous, dehiscent loculicidally. *Seeds* oblong, compressed, black, shining; endosperm fleshy.

Underground stem a large bulb; produced leaves 1-2, vanishing very early; stem tall, with many pinnate branches; flowers solitary.

Endemic; species 1, distributed from Natal to the Katberg; also found in the eastern O.F.S. and northern Transvaal.

1012

20. ERIOSPERMUM, Jacq.

Perianth marcescent, persistent; tube 0; segments sub-equal, 1-nerved. *Stamens* attached to the base of the perianth-segments; filaments lanceolate or filiform; anthers dorsifixed, dehiscent introrsely. *Ovary* sub-sessile, globose, with few, rarely 2, ovules in each chamber; style subulate; stigma capitate. *Fruit* coriaceous, loculicidally 3-valved down to the base, with the valves persistent. *Seeds* few, densely and persistently pilose; embryo long, cylindric, often projecting beyond the fleshy endosperm.

Rootstock large and tuberous; leaves usually solitary, produced after the flowers; inflorescence a raceme; bracts minute.

An African genus of over 60 species; about 45 species found in South Africa, from Little Namaqualand to Natal and the Transvaal; rare in the central districts, but recorded from Somerset East, Graaff-Reinet, and Barkly West.

1024

21. KNIPHOFIA, Moench.

Perianth-tube long, cylindric or funnel-shaped; segments sub-equal, small, much shorter than the tube. *Stamens* hypogynous, as long as the perianth or longer; the 3 stamens opposite the inner segments longer than the others; filaments filiform; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* sessile, ovoid, with many ovules; style long, filiform; stigma minute, capitate. *Fruit* globose or slightly ovoid, with loculicidal dehiscence. *Seeds* acutely 3-angled, punctate; endosperm fleshy.

Rootstock neither bulbous nor tuberous; leaves all radical, persistent, narrowed gradually to the apex; inflorescence a sub-spicate raceme; peduncle long, naked; pedicels articulated at the apex; bracts scarious, persistent, longer than the pedicels.

Species about 80, natives of Africa; 2 species in Madagascar; 51 species recorded from South Africa, extending from the Cape to Natal, the O.F.S. and the Transvaal; also recorded from Somerset East, Graaff-Reinet, and Aliwal North.

1025

22. NOTOSCEPTRUM, Benth.

Perianth-tube very short or almost obsolete; segments sub-equal, as long as or longer than the tube; 3 outer segments 3-nerved; 3 inner segments 1-nerved. *Stamens* hypogynous; filaments rather flattened, as long as the perianth; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* ovoid, with several ovules in each chamber; style declinate, longer than the stamens; stigma entire. *Fruit* sub-globose, with loculicidal dehiscence. *Seeds* few, angled, black.

Rootstock a short thick rhizome; leaves radical, crowded; inflorescence a dense spike; peduncle simple.

Species 5; 2 in Angola; 3 species in South Africa, found only in Natal and the northern Transvaal.

1026

23. ALOE, Linn.

Perianth-tube campanulate or cylindric; segments elongated, much imbricated, spreading only at the tip. *Stamens* 6, hypogynous, equalling or exceeding the perianth; filaments subulate; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* sessile, oblong, slightly 3-angled, with many ovules; style filiform; stigma small, capitate. *Fruit* oblong, bluntly 3-angled, coriaceous, loculicidally 3-valved. *Seeds* 3-angled or flattened, often winged; endosperm fleshy; embryo straight.

Plants with or without stems; stems simple or branched; leaves fleshy, usually crowded in a dense rosette and toothed or prickly on the margins; inflorescence a raceme or corymb; pedicels solitary; bracts persistent.

Species about 150, found in Africa, Madagascar, Socotra, India, China, Arabia, and the Mediterranean Region; about 90 species recorded from South Africa, widely distributed over the Union.

1027

24. GASTERIA, Duval

Perianth-tube curved, cylindric in the upper half, ventricose in the lower half; segments sub-equal, ovate, shorter than the tube. *Stamens* hypogynous, about as long as the perianth; filaments filiform; anthers dorsifixed, versatile, dehiscing down the face. *Ovary* sessile, oblong, 3-angled, with numerous ovules; style filiform; stigma capitate, slightly 3-lobed.

Fruit chartaceous, loculicidally 3-valved. *Seeds* compressed, winged ; endosperm fleshy ; embryo axile.

Stem none or short ; leaves thick, fleshy, distichous or multifarious, usually spotted with white ; inflorescence a lax raceme ; pedicels articulated at the apex ; bracts small, persistent.

Endemic ; species over 50, mainly in the central districts, but also found in the coastal belt and extend into Natal and the Transvaal.

1028

25. APICRA, Willd.

Perianth-tube straight, oblong-cylindric ; segments sub-equal, spreading at the tip, with 3 green stripes down the keel. *Stamens* hypogynous, shorter than the perianth ; filaments filiform ; anthers versatile, dehiscent introrsely. *Ovary* sessile, 3-angled, with numerous ovules ; style short, subulate ; stigma capitate. *Fruit* oblong, 3-angled, coriaceous, loculicidally 3-valved. *Seeds* compressed ; endosperm fleshy.

Stem always elongated, leafy ; leaves short, thick, fleshy, multifarious or quinquefarius ; inflorescence a sub-spicate raceme or panicle ; pedicels short, ascending ; bracts small, ovate.

Endemic ; species 8, extending from Riversdale, Alexandria, and Albany into the central districts.

1029

26. HAWORTHIA, Duval

Perianth bilabiate ; tube straight, oblong-cylindric ; segments sub-equal ; the 3 lower segments reflexing more than in the 3 upper. *Stamens* 6, hypogynous, shorter than the perianth ; filaments filiform ; anthers versatile, dehiscent introrsely. *Ovary* sessile, oblong, 3-angled, with numerous ovules ; style subulate ; stigma capitate. *Fruit* oblong, 3-angled, chartaceous, loculicidally 3-valved. *Seeds* compressed, acutely angled ; endosperm fleshy ; embryo axile.

Stem short or elongated ; leaves short, thick, fleshy, generally multifarious, often tubercled, sometimes toothed or ciliated on the edges and keel ; inflorescence a raceme or panicle ; pedicels short, ascending ; bracts small ; perianth whitish, ribbed with green or reddish-brown.

An African genus, with 72 species in South Africa, fairly widely distributed but absent from the Cape and Natal ; 1 species recorded from the Transvaal and 1 species extends into Angola.

1029a

27. CHORTOLIRION, Berger

(*Haworthia*, Duval partly.)

Perianth sub-sessile, sub-bilabiate ; tube obclavate-cylindric ; 3 upper segments straight ; 3 lower segments usually slightly recurved. *Stamens* 6 ; filaments slightly unequal, shorter than the perianth-tube ; anthers oblong ; dehiscent introrsely. *Ovary* with several ovules in each chamber ; style straight, gradually merging into the ovary ; stigma capitate. *Fruit* oblong-conical, more or less acuminate.

Small perennial plants, scarcely succulent ; leaves basal, spirally arranged, narrowly linear or grasslike, much widened at the base and congested into a round or oblong bulb, above the dilated base once or twice articulated, with the portion above the articulation deciduous, with the margins denticulate with recurved teeth ; peduncle slender, simple, bearing a few empty bracts ; raceme lax, sub-secund ; flowers shortly pedicelled ; bracts deltoid-ovate, cuspidate.

An African genus of 4 species ; 3 species in South Africa, recorded from the Transvaal and Bechuanaland.

1046

28. AGAPANTHUS, L'Her.

Perianth-tube tubular; segments sub-equal, much longer than the tube. *Stamens* inserted in the throat of the perianth-tube; filaments filiform, as long as the perianth-segments; anthers dorsifixed, dehiscing introrsely. *Ovary* sessile, with numerous ovules; style filiform; stigma minute. *Fruit* coriaceous, elongate-oblong, loculicidally 3-valved. *Seeds* flat, blackish, with an oblong wing.

Rootstock tuberous; leaves radical; inflorescence a large umbel; peduncle stout, naked; spathe-valves 2.

Endemic; species 3, extending from Natal to the Cape, also into the northern Transvaal and eastern O.F.S.

1047

29. TULBAGHIA, Linn.

Perianth-tube oblong or cylindric, with a corona in the throat which is either entire and annular or of 3 distinct processes; segments sub-equal, spreading, generally shorter than the tube. *Stamens* in 2 series, inserted on the perianth-tube; filaments short; anthers dorsifixed, dehiscing introrsely. *Ovary* sessile, with many ovules; style short, columnar; stigma capitate. *Fruit* oblong, ehartaceous, loculicidally 3-valved. *Seeds* oblong, compressed, blackish; endosperm fleshy.

Rootstock tuberous; leaves radical, linear or lorate, fleshy; inflorescence an umbel; peduncle naked; spathe-valves 2.

An African genus of 25 species; 10 species in South Africa, widely distributed.

1049

30. ALLIUM, Linn.

Perianth-tube 0; segments sub-equal, spreading or permanently connivent. *Stamens* attached to the base of the perianth-segments; filaments filiform or flattened; the 3 inner tricuspidate; anthers dorsifixed, dehiscing introrsely. *Ovary* sessile or shortly stipitate, with usually 2 ovules in each chamber (ovules 2 in the only South African species); style filiform, usually inserted into a central hollow of the ovary; stigma capitate or tricuspidate. *Fruit* globose, membranous, dehiscing loculicidally. *Seeds* angled, black; endosperm fleshy.

Underground stem a tunicated bulb or short rhizome; leaves all radical, but often sheathing the base of the peduncle for some distance; inflorescence an umbel; spathe-valves usually 2, membranous.

Species 250-300, concentrated in the north temperate zone of both hemispheres; a single native species in South Africa, extending from Little Namaqualand to Uitenhage; also recorded from Graaff-Reinet, Queenstown, and the O.F.S.

1079

31. ALBUCA, Linn.

Perianth persistent; tube 0; segments unequal; 3 outer segments oblong, more or less spreading; 3 inner segments shorter, permanently connivent, cucullate and furnished with a large gland at the apex. *Stamens* hypogynous, all fertile, or the anthers of the 3 outer small and imperfect, or absent; filaments often winged and dilated at the base; anthers versatile, dehiscing introrsely. *Ovary* sessile, with many ovules; style usually obconic, 3-angled, rarely cylindric; stigma 3-lobed. *Fruit* ovoid, 3-angled, membranous, loculicidally 3-valved. *Seeds* compressed, sometimes almost winged, black; endosperm fleshy.

Underground stem a tunicated bulb ; leaves all radical, flat and tapering to a long point, or terete ; inflorescence a raceme ; bracts acuminate ; flowers yellow or white, usually broadly keeled with green or reddish brown, rarely entirely green.

Species about 130, mainly African ; 69 species in South Africa, extending from S.W. Africa to Natal and widely distributed in the central districts ; a few species found in Arabia ; the remainder in tropical Africa.

1080

32. URGINEA, Steinh.

Perianth deciduous ; tube 0 ; segments sub-equal ; i-nerved on the keel (in the South African species). *Stamens* inserted at the base of the perianth, segments ; filaments filiform, or flattened at the base or middle ; anthers versatile, dehiscing introrsely. *Ovary* sessile, ovoid, with few or many ovules in each chamber ; style filiform ; stigma capitate. *Fruit* globose, 3-angled-membranous, loculicidally 3-valved. *Seeds* discoid, often winged, black ; endosperm fleshy.

Underground stem a tunicated bulb ; leaves often not produced till after the flowers ; inflorescence a raceme ; peduncle naked ; bracts often spurred either at the base or the middle ; flowers whitish, with green or purple-brown keels.

Species about 80, found in Africa, the Mediterranean region, and India ; nearly 40 species in South Africa, widely distributed over the Union.

1081

33. GALTONIA, Dene.

Perianth marcescent ; tube oblong or clavate ; segments unequal, longer or shorter than the tube ; outer segments oblong ; inner segments obovate. *Stamens* inserted below the throat of the perianth-tube ; filaments filiform ; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* sessile, oblong, 3-angled, with many ovules ; style cylindric ; stigma capitate. *Fruit* oblong, membranous, loculicidally 3-valved. *Seeds* very numerous, angled by pressure, black ; endosperm fleshy ; embryo cylindric, as long as the endosperm.

Underground stem a tunicated bulb ; leaves large, fleshy ; inflorescence a lax raceme ; peduncle naked ; pedicels articulated at the apex ; bracts large, membranous ; flowers large, white or tinged with green.

Endemic ; species 3, extending through eastern regions to Zululand ; also found in the O.F.S., the Transvaal, and at Aliwal North.

1082

34. DRIMIA, Jacq.

Perianth deciduous from the base ; tube campanulate ; segments sub-equal or reflexing, generally cucullate at the apex. *Stamens* inserted in the throat of the perianth-tube, shorter than the segments ; filaments filiform ; anthers versatile, dehiscing introrsely. *Ovary* sessile, ovoid, with many ovules ; style filiform ; stigma capitate, faintly 3-lobed. *Fruit* ovoid, 3-angled, membranous, loculicidally 3-valved. *Seeds* discoid, sometimes winged, black ; endosperm fleshy ; embryo cylindric.

Underground stem a tunicated bulb ; leaves broad and rather fleshy, or narrow and rigid, often produced at a different season to the flowers ; inflorescence a raceme ; bracts membranous, persistent.

An African genus of about 41 species ; 28 in South Africa, widely distributed ; 12 species in tropical Africa.

1083

35. RHADAMANTHUS, Salisb.

Perianth-tube campanulate ; segments equal, about as long as the tube. *Stamens* inserted below the throat of the perianth-tube, sub-uniseriate ; filaments flattened downwards ; anthers connivent, dehiscing introrsely. *Ovary* sessile, ovoid, with many ovules ; style short, columnar ; stigma

capitate. *Fruit* membranous, ovoid, loculicidally 3-valved. *Seeds* discoid, winged, 6-8 in each loculus, black; endosperm firm.

Underground stem a tunicated bulb; leaves produced after the flowers; inflorescence a lax raceme; peduncle naked.

Endemic; species 1, perhaps 2; recorded from Montagu, the Karroo below the Roggeveld, and Komgha.

1084

36. DIPCADI, Medik.

Perianth deciduous; tube oblong-cylindric; segments dimorphic; outer segments reflexing, convolute, often longer than the inner; inner segments connivent, many-nerved on the back, spreading only at the tip. *Stamens* inserted in or below the throat of the perianth-tube; filaments filiform; anthers linear, dorsifixed, dehiscing introrsely. *Ovary* sessile or sub-stipitate, ovoid, with several ovules in each chamber; style cylindric; stigma capitate. *Fruit* sub-quadrangle, membranous, loculicidally 3-valved. *Seeds* discoid, black; endosperm firm in texture; embryo cylindric.

Underground stem a tunicated bulb; leaves basal, usually linear or sub-terete; inflorescence a lax raceme; pedicels articulated at the apex; bracts membranous; flowers usually green.

Species about 30, found in Africa, Madagascar, the Mediterranean Region, and India; 16 species in South Africa, widely distributed over the Union.

1085

37. LITANTHUS, Harv.

Perianth deciduous; tube oblong; segments ascending, ovate, obtuse, shorter than the tube. *Stamens* inserted below the perianth-throat; filaments shorter than the anthers; anthers with a produced emarginate connective, dehiscing introrsely. *Ovary* sessile, ovoid, with many ovules; style cylindric; stigma capitate. *Fruit* ovoid, membranous, loculicidally 3-valved. *Seeds* compressed, black.

Bulb white, globose; leaves usually 2, produced after the flowers; flowers solitary or 2-nate; peduncle filiform, naked; bracteoles connate, spurred.

Endemic; species 1, extending from Natal and Swaziland to Uitenhage.

1086

38. SCILLA, Linn.

Perianth persistent; tube 0; segments sub-equal, spreading, 1-nerved. *Stamens* attached to the base of the perianth-segments; filaments filiform or slightly flattened; anthers versatile, dehiscing introrsely. *Ovary* sessile or shortly stipitate, with 2 or several ovules in each chamber; style filiform; stigma capitate. *Fruit* a 3-valved loculicidal capsule. *Seeds* globose, or angled by pressure, black; endosperm firm.

Underground stem a tunicated bulb; leaves all radical, sub-terete or flat; inflorescence a raceme; bracts small; flowers generally blue or mauve-purple.

Species about 150, widely spread through the Old World: 75 species in South Africa; mainly confined to the eastern districts but extend to Namaqualand, Natal, the Transvaal, the O.F.S. and into a few of the central districts.

1088

39. EUCOMIS, L'Her.

Perianth persistent; tube very short; segments sub-equal, 1-nerved, spreading. *Stamens* attached above the base of the perianth-segments; filaments deltoid at the base; anthers versatile, dehiscing introrsely. *Ovary* sessile, sub-globose, with many ovules; style cylindric; stigma capitate or minutely tricuspidate. *Fruit* membranous, loculicidally 3-valved. *Seeds* obovoid, not compressed, black or brown; embryo nearly as long as the horny endosperm.

Underground stem a large tunicated bulb; leaves multifarious; inflorescence a raceme, crowned with a coma of empty leafy bracts; peduncle cylindrical or clavate; flowers greenish.

Endemic; species 15; mainly in the eastern districts, Natal, and the O.F.S.; 1 species extends to Riversdale and a few to the central districts; 1 species in central Africa.

1089.

40. ORNITHOGALUM, Linn.

Perianth persistent, tube 0; segments sub-equal, spreading, with or without a distinct few-nerved keel. *Stamens* hypogynous; filaments usually more or less flattened, often unequal; anthers versatile, dehiscent introrsely. *Ovary* sessile, with many ovules in each chamber; style short or elongated; stigma capitate. *Fruit* membranous, loculicidally 3-valved. *Seeds* globose, or angled by pressure, black; endosperm firm; embryo short.

Underground stem a tunicated bulb; leaves all radical; inflorescence a raceme or corymb; peduncle naked; bracts scarious, persistent; flowers usually white or yellow, never blue nor mauve-purple.

Species about 150, widely spread in the Old World; 93 species in South Africa, widely distributed.

1090

41. DRIMIOPSIS, Lindl.

Perianth persistent; tube 0; segments 1-nerved; the 3 inner segments cucullate at the tip. *Stamens* inserted at the base of the perianth-segments; filaments dilated at the base; anthers versatile, dehiscent introrsely. *Ovary* sessile, globose, 3-angled, with 2 ovules in each chamber; style cylindrical; stigma capitate. *Fruit* globose, membranous, loculicidally 3-valved. *Seeds* 1-2 in each loculus, turgid.

Underground stem a tunicated bulb; leaves usually fleshy and flaccid, petioled or sessile; inflorescence a dense sub-spicate raceme; peduncle naked; bracts obsolete.

An African genus of 19 species; 7 species in South Africa, extending from Natal to East London; 1 species found in Namaqualand and 1 in the Transvaal; 12 species found in tropical Africa.

1093

42. HYACINTHUS, Linn.

Perianth-tube campanulate or oblong; segments sub-equal, falcate, as long as or longer than the tube. *Stamens* inserted at or below the throat of the perianth-tube; filaments filiform; anthers versatile, dehiscent introrsely. *Ovary* ovoid, sessile, with few ovules in each chamber; style cylindrical; stigma capitate. *Fruit* membranous, loculicidally 3-valved. *Seeds* globose, black; embryo cylindrical, much shorter than the horny endosperm.

Underground stem a bulb with membranous tunics; leaves all radical, fleshy; inflorescence a raceme; bracts small, membranous.

Species about 45, nearly all of the Oriental and Mediterranean regions; 1 species in tropical Africa; 2 species in South Africa, recorded only from the south-western districts of the Cape Province.

1094

43. PSEUDOGALTONIA, O.Kuntze

Perianth-tube cylindrical, slightly curved, green, white above; segments 2-3-times shorter than the tube, broadly obtuse or somewhat acute. *Stamens* in 1 row, inserted in the perianth-throat, included; filaments straight, short; anthers linear-oblong, equalling the filaments. *Ovary* oblong, with many ovules; style scarcely exceeding the perianth.

Underground stem a large bulb, with fibrous tunics; leaves rigid, ensiform; inflorescence a dense many-flowered raceme; bracts scarious, linear.

Species 2; 1 from S.W. Africa; 1 in tropical Africa.

1097

44. VELTHEIMIA, Gleditsch

Perianth-tube long, cylindric; segments ovate, much shorter than the tube. *Stamens* inserted at the middle of the perianth-tube; filaments filiform; anthers dorsifixed, dehiscing introrsely. *Ovary* sessile, oblong, with 2 ovules in each chamber; style filiform; stigma capitate. *Fruit* large, membranous, turbinate, acutely 3-angled, loculicidally 3-valved. *Seeds* turbinate, black; endosperm horny.

Underground stem a large bulb with membranous tunics; leaves all radical; inflorescence a dense raceme; peduncle naked; bracts membranous, lanceolate-acuminate.

Endemic; species 4, extending from Little Namaqualand to Kaffraria.

1098

45. LACHENALIA, Jacq.

Perianth persistent; tube campanulate; segments unequal; the 3 outer segments slightly gibbous near the apex; the 3 inner segments usually longer, spatulate, spreading upwards. *Stamens* inserted on the perianth-tube; filaments filiform; anthers versatile, dehiscing introrsely. *Ovary* ovoid, with many ovules; style long, slender; stigma capitate. *Fruit* obovoid, 3-angled, membranous or sub-coriaceous, loculicidally 3-valved. *Seeds* turgid, black; endosperm moderately firm.

Underground stem a tunicated bulb; leaves usually 2, clasping at the base of the peduncle, often spotted; inflorescence a raceme or spike; peduncle leafless; bracts persistent.

Endemic; species about 55, mostly in the south-western districts, but extending into Namaqualand and to Albany; 1 species in the Transkei and a few in the central districts.

1099

46. POLYXENA, Kunth

Perianth persistent; tube cylindric or infundibuliform; segments equal, shorter than the tube. *Stamens* in two series at the throat of the perianth-tube; filaments filiform, distinct or connate at the base; anthers dorsifixed, versatile, dehiscing introrsely. *Ovary* sessile, flask-shaped, with many ovules in each chamber; style subulate; stigma capitate. *Fruit* membranous, loculicidally 3-valved. *Seeds* small, globose, black, shining; endosperm firm in texture.

Underground stem a tunicated bulb; leaves 2, usually erect; inflorescence a corymb; bracts not involucre.

Endemic; species 15, mainly in the central districts, but found from Little Namaqualand to Colesberg; also in the Worcester and Uitenhage districts.

(NOTE.—*Polyxena* of "Flora Capensis" is partly *Neobakeria*, Schltr.)

1099a

47. NEOBAKERIA, Schltr.

(*Polyxena*, Kunth partly).

Perianth deeply 6-fid; tube cylindric; segments narrowly elliptic, somewhat obtuse or acute, usually slightly narrowed at the base. *Stamens* in one row in the perianth-throat; filaments dilated and shortly connate at the base, commonly much exceeding the perianth-segments; anthers oval. *Ovary* ovoid, with 4-6 ovules in 2 rows in each chamber.

Dwarf perennial herbs; bulb ovoid or sub-globose; leaves 2, erect-spreading or more or less flat on the ground, elliptic or ovate, sub-fleshy, glabrous; inflorescence a shortly peduncled raceme, sometimes cylindric, sometimes head-like; involucre absent; flowers white or pink; bracts slender, much shorter than the flowers.

Endemic; species 7, found in S.W. Africa, the O.F.S., and the central districts.

1100

48. WHITEHEADIA, Harv.

Perianth persistent; tube very short; segments sub-equal, spreading, 3-5-nerved, longer than the tube. *Stamens* inserted in the throat of the perianth-tube; filaments connate at the base; anthers dorsifixed, versatile, dehiscent introrsely. *Ovary* sessile, globose, with many ovules; style subulate; stigma capitate. *Fruit* sub-globose, acutely 3-angled, membranous, loculicidally 3-valved. *Seeds* flask-shaped, black, shining; endosperm cartilaginous.

Underground stem a tunicated bulb; leaves 2; inflorescence a dense sub-spicate raceme; bracts round-cuspidate.

Endemic; species 1, found in Little Namaqualand and south of Graaff-Reinet.

1100a

49. NEOPATERSONIA, Schönl.

Perianth-tube short; segments sub-equal, spreading. *Stamens* sub-1-seriate, fixed in the throat of the perianth; filaments broadened and connate at the base, gradually narrowed above; anthers dorsifixed, with introrse dehiscence. *Ovary* sessile, sub-ovoid, 3-furrowed, with many ovules; style filiform; stigma of 3 very short spreading branches. *Fruit* membranous, 3-grooved, with loculicidal dehiscence. *Seeds* numerous, flask-shaped, rough.

Underground stem a tunicated bulb; leaves linear, erect; inflorescence a lax raceme.

Endemic; species 1, recorded only from the Uitenhage district.

1101

50. MASSONIA, Thunb.

Perianth-tube cylindric; segments sub-equal, spreading or reflexed. *Stamens* inserted in the perianth-throat; filaments united into a cup at the base; anthers dorsifixed, dehiscent introrsely. *Ovary* sessile, with many ovules in each chamber; style cylindric; stigma capitate. *Fruit* obovate, 3-angled, membranous, loculicidally 3-valved. *Seeds* globose, black; endosperm moderately firm in texture.

Underground stem a tunicated bulb; leaves 2, broad; inflorescence a sessile or sub-sessile globose head, surrounded by a number of imbricated bracts; pedicels short, not articulated.

Endemic; species 37, mainly in the central districts, but extending into Namaqualand and to Uitenhage.

1101a

51. ANDROSIPHON, Schltr.

Perianth deeply 6-fid; tube somewhat elongated; segments narrowly oblong, obtuse, erect-spreading. *Stamens* twice as long as the perianth; filaments united into a column as long as the perianth, with the free portion of the filament subulate, glabrous; anthers oblong, obtuse, dorsifixed. *Ovary* oblong, with 8-10 ovules in 2 rows in each chamber; style erect, subulate, simple, a little shorter than the stamens.

A somewhat dwarf herb with the habit of *Massonia*; underground stem a bulb; leaves 2, basal, broadly elliptic; inflorescence shortened, head-like, congested, many-flowered, without an involucre; bracts erect-spreading, lanceolate, acute.

Endemic; species 1, recorded only from the Onder-Bokkeveld (Ceres district).

1102

52. DAUBENYA, Lindl.

Flowers, especially the outer ones, prominently bilabiate; tube cylindric; segments unequal. *Stamens* inserted at different heights near the base of the perianth-segments; filaments short, filiform; anthers dorsifixed, dehiscent introrsely. *Ovary* sessile, with several ovules in each chamber; style cylindric; stigma capitate.

Underground stem a tunicated bulb; leaves 2; inflorescence a sessile or sub-sessile head.

Endemic; species 1, only recorded from the Calvinia district.

1109

53. DRACÆNA, Linn.

Perianth-tube cylindric; segments spreading or reflexed. *Stamens* inserted in the throat of the perianth-tube; filaments filiform or slightly flattened; anthers dorsifixed, versatile, dehiscent introrsely. *Ovary* sessile, ovoid, with a single ovule in each chamber; style filiform; stigma capitate. *Fruit* a globose berry. *Seeds* often 1-2 by abortion, globose, or angled by pressure; with the testa often pulpy; endosperm horny; embryo small.

Stems woody, simple or branched, usually erect and stout, marked with the scars of the fallen leaves; leaves sessile and ensiform, or petioled and elliptic, closely veined; inflorescence a raceme or panicle; pedicels articulated; bracts small, scarious, persistent; flowers white or greenish.

Species about 112, spread throughout the tropical and sub-tropical zones of the Old World; 3 species in South Africa, 1 extending from Natal to Uitenhage, 2 in the Transvaal.

1110

54. SANSEVIERIA, Thunb.

Perianth-tube cylindric; segments sub-equal, spreading. *Stamens* inserted in the throat of the perianth-tube; filaments filiform; anthers versatile. *Ovary* with a single ovule in each chamber; style filiform; stigma capitate. *Fruit* a berry. *Seeds* 1-3, globose, fleshy.

Rootstock a creeping rhizome; leaves in rosettes from the nodes, rigid, flat, sub-terete, or terete; inflorescence a dense cylindric raceme or panicle; peduncle elongated with only a few scarious bracts; pedicels articulated, usually fascicled.

Species 54, chiefly confined to Africa and the neighbouring islands, and Arabia; 5 species in South Africa, recorded from the central districts; found also in S.W. Africa, and from Uitenhage to Natal and the Transvaal.

1113

55. ASPARAGUS, Linn.

Perianth-tube 0; segments sub-equal, spreading. *Stamens* inserted at the base of the perianth-segments; filaments filiform or slightly flattened; anthers dorsifixed, versatile, dehiscent introrsely. *Ovary* sessile, globose, with 2 or few ovules in each chamber; style filiform; stigma tricuspidate. *Fruit* a globose berry. *Seeds* often solitary, globose, or angled by pressure, black; endosperm horny.

Stems erect or scandent, often woody; leaves small, scarious, often produced into spines at the base; branches in the form of cladodia, solitary or fascicled in the axils of the leaves, usually sub-terete, rarely flattened; flowers usually axillary, rarely racemose; pedicels articulated.

Species about 150, spread through the temperate and tropical regions of the Old World; 58 species recorded from South Africa, widely distributed.

1147

56. BEHNIA, Didrichs.

Perianth-tube funnel-shaped ; segments sub-equal, ovate, spreading, as long as the tube. *Stamens* inserted at the middle of the perianth-tube ; filaments short and thick ; anthers dorsifixed, versatile, dehiscent introrsely. *Ovary* contracted at the base into a short gynophore, with few ovules in each chamber ; style short ; stigmas 3, spreading. *Fruit* a globose berry. *Seeds* sub-globose, black ; endosperm horny.

Stem slender, woody, copiously branched ; leaves alternate, ovate, distinctly veined ; inflorescence a simple or slightly compound cyme from the axils of the upper leaves ; pedicels articulated at the apex ; bracts persistent, scarious, ovate-lanceolate.

Endemic ; species 1, extending from Natal and the northern Transvaal to Uitenhage ; also found in Somerset East.

1151

57. SMILAX, Linn.

Plants dioecious. *Perianth-tube* 0 ; segments distinct, sub-equal. *Male flowers* : *Stamens* inserted at the base of the perianth-segments ; filaments filiform ; anthers erect, dehiscent introrsely. *Ovary* 0. *Female flowers* : *Staminodes* filiform. *Ovary* sessile, ovoid, with 1-2 ovules in each chamber ; style 0 or short ; stigmas 3. *Fruit* a globose berry. *Seeds* 1-2 by abortion, globose ; endosperm horny ; embryo minute.

Rootstock often large ; stems usually woody, often prickly ; leaves alternate, with a pair of spiral tendrils at the base of the petiole ; inflorescence a small umbel.

Species nearly 300, cosmopolitan ; 1 in South Africa, recorded from Natal and the northern Transvaal.

26. HÆMODORACEÆ.

Perianth of 6 segments in 2 whorls, free or shortly united at the base. *Stamens* 3, usually opposite the inner segments, included or exserted, sometimes declinate. *Ovary* superior or inferior, 3-chambered (rarely 1-2 chambers sterile), with 1 or numerous ovules in each chamber ; style simple ; stigma capitate, minute, or stigmas 3. *Fruit* a loculicidal capsule. *Seeds* flat.

Herbs, with a woody or tuberous rootstock, or underground stem a corm ; leaves 2-ranked ; inflorescence a panicle or raceme, or rarely flowers solitary ; flowers yellow.

Genera 9, with about 30 species, natives of Australia, North and South America and South Africa.

1. Ovary superior, 3-chambered, or with only 1 chamber developed and 1-2 chambers small and empty ; ovule solitary 2
- Ovary inferior, 3-chambered ; ovules many, or ovule solitary in each chamber 3
2. Ovary 3-chambered ; inflorescence a panicle 3. *Wachendorfia*, Linn.
- Ovary with 1 fertile chamber ; inflorescence a raceme 1. *Barberetta*, Harv.
3. Ovule solitary in each chamber ; inflorescence a panicle 2. *Dilatris*, Berg.
- Ovules many in each chamber ; flowers solitary 4. *Pauridia*, Harv.

1158

1. BARBERETTA, Harv.

Perianth funnel-shaped ; tube 0 ; segments equal, 3-5 nerved. *Stamens* 3, attached to the base of the outer segments, exserted. *Ovary* superior, oblique, with 1 perfect chamber containing a single ovule and with 1-2 empty chambers ; stigma capitate.

Rootstock tuberous ; leaves with very distinct vertical ribs ; inflorescence a raceme ; flowers bright orange.

Endemic ; species 1, extending from Tembuland to Natal.

1160

2. DILATRIS, Berg.

Perianth divided to the base ; segments sub-equal. *Stamens* 3, attached to the base of the inner segments. *Ovary* inferior, globose, 3-chambered, with a solitary ovule in each chamber ; stigma minute. *Capsule* globose, hairy, indehiscent or finally dehiscing longitudinally. *Seeds* discoid.

Rootstock short, woody ; leaves several in a distichous basal rosette ; peduncle hairy, elongated, with a few reduced leaves ; inflorescence a short congested panicle.

Endemic ; species 2, extending from the Cape to Riversdale.

1162

3. WACHENDORFIA, Linn.

Perianth rather oblique, funnel-shaped ; segments sub-equal ; 3 outer segments firmer, hairy without ; 3 inner segments shortly joined and sometimes obscurely spurred at the base. *Stamens* 3, opposite the inner segments, included, declinate ; anthers ovate-sagittate. *Ovary* superior, 3-chambered, with a single ovule in each chamber ; style declinate ; stigma capitate. *Capsule* acutely 3-lobed, dehiscing loculicidally.

Roots tuberous, usually of a reddish colour ; leaves lanceolate, plicate ; inflorescence a panicle ; flowers usually yellow.

Endemic ; species 2, ranging from Malmesbury to the Uitenhage district.

1165

4. PAURIDIA, Harv.

Perianth with a short tube above the ovary ; segments sub-equal, spreading. *Stamens* 3, inserted on the perianth-tube opposite the inner segments. *Ovary* inferior, clavate, 3-chambered, with many ovules in each chamber ; style short ; stigmas 3, subulate, falcate, sometimes 1 or 2 abortive, or the whole style abortive and the flowers then male. *Capsule* membranous, obconic, crowned with the faded perianth. *Seeds* many, globose, minute.

Corm globose, with a ring of bristles at the top ; leaves linear ; peduncles several to a corm, 1-flowered ; perianth-segments yellow, tipped with green.

Endemic ; species 1, extending from the Cape to Riversdale.

27. AMARYLLIDACEÆ.

Flowers bisexual, regular or nearly so. *Perianth* corolline ; tube long-cylindric, short, or 0, rarely with a glandular ring in the throat ; segments 6, in 2 series, shorter or longer than the tube. *Stamens* usually 6, rarely 3, 12, or 18, in one series, rarely in 2 series ; filaments free or sometimes united at the base, filiform, erect, rarely declinate, or connivent in a cone ; anthers dorsi- or basi-fixed, dehiscing by longitudinal slits, rarely by terminal pores. *Ovary* inferior, rarely half-inferior, 3-chambered, with 1 to many ovules in each chamber ; style simple ; stigma capitate or tricuspidate, rarely with 3 distinct branches. *Fruit* usually a 3-valved capsule, more rarely a berry. *Seeds* few or many, bulbiform or angled, rarely winged ; endosperm fleshy ; embryo small, central.

Usually acaulescent herbs ; underground stem a bulb or corm ; leaves radical ; inflorescence an umbel, raceme, rarely a head, or flowers solitary ; spathe-valves usually 2, sometimes numerous and coloured.

Genera about 70, species almost 700, spread widely in the temperate and tropical regions of both hemispheres.

Tribe **Amaryllidææ**: Underground stem a tunicated bulb; leaves all radical; rarely coriaceous; inflorescence usually an umbel, subtended by a spathe; flowers various in colour, never hairy on the outside; stamens free (genera 1-16).

Tribe **Narcisseæ**: Perianth with a distinct corona, or the filaments united into a cup-shaped structure (genus 17).

Tribe **Hypoxidææ**: Underground stem a tunicated corm; leaves all radical, dry, persistent; inflorescence not subtended by a spathe; flowers usually yellow and hairy outside (genera 18-21).

Tribe **Conantherææ**: Underground stem a corm or bulb; inflorescence usually racemose; perianth glabrous, deciduous; stamens usually dehiscent by apical pores (genera 22-23).

Tribe **Conostylidææ**: Underground stem a corm; inflorescence a panicle; peduncle and flowers densely woolly (genus 24).

1. Involucral bracts many, green or bright red; fruit a berry 2
Involucral bracts usually 2, sometimes only 1; fruit a capsule,
rarely succulent, very rarely a berry, but then fruit beneath the
ground 3
2. Involucral bracts somewhat fleshy, bright red; ovules 2 in each
ovary chamber 2. *Hæmanthus*, Linn.
Involucral bracts membranous, green; ovules more than 2 in each
ovary chamber 4. *Clivia*, Lindl.
3. Style 3-angled in the lower half 5. *Strumaria*, Jacq.
Style terete 4
4. Anthers unequal or connivent in a cone, dehiscent by apical pores 5
Anthers all alike, dehiscent by longitudinal slits 6
5. Stamens connivent in a cone 22. *Walleria*, Kirk.
Stamens unequal, one or more distinctly declinate 23. *Cyanella*, Linn.
6. Inflorescence a densely woolly panicle; ovary half-inferior
24. *Lanaria*, Ait.
Inflorescence an umbel, raceme, or flowers solitary; ovary inferior 7
7. Perianth with a glandular ring in the throat, or the filaments united
into a conspicuous cup 8
Perianth without a glandular ring or cup in the throat 10
8. Flowers solitary without a visible peduncle 12. *Klingia*, Schönl.
Flowers in an umbel at the end of a well-developed peduncle 9
9. Flowers red; perianth with a glandular ring in the throat 9. *Vallota*, Herb.
Flowers white; filaments united in a conspicuous cup 17. *Pancratium*, Linn.
10. Inflorescence a raceme, rarely a head, or flowers solitary 11
Inflorescence an umbel 18
11. Perianth-tube 0 or very short; segments much longer than the tube 12
Perianth-tube slender or funnel-shaped; segments shorter than the
tube, rarely of the same length 15
12. Filaments adnate to the back of the anthers 13
Anthers basifixed 14
13. Ovary produced into a long almost filiform beak; bracts none;
fruit succulent, indehiscent 18. *Forbesia*, Eckl.
Ovary without a beak; bracts foliaceous or setaceous; fruit a
capsule, dehiscent 20. *Ianthé*, Salisb.
14. Perianth-tube short, sub-funnel-shaped; flowers rosy, white-rosy,
or very rarely white 21. *Rhodohypoxis*, Nel
Perianth-tube none; flowers yellow, very rarely whitish-yellow 19. *Hypoxis*, Linn.
15. Stamens in 2 series, 3 in the throat of the perianth, 3 below 13. *Apodolirion*, Bkr.
Stamens in 1 series, usually 6, sometimes 12 or 18; filaments some-
times unequal 16
16. Anthers dorsifixed 15. *Cyrtanthus*, Ait.
Anthers basifixed 17
17. Anthers twisting up spirally when the flower expands 11. *Gethyllis*, Linn.
Anthers not twisting spirally 18. *Forbesia*, Eckl.

- | | |
|---|--------------------------------------|
| 18. Stamens in 2 series | 10 <i>Anoiganthus</i> , <i>Bkr.</i> |
| Stamens in 1 series | 19 |
| 19. Anthers basifixed | 1. <i>Hessea</i> , <i>Herb.</i> |
| Anthers dorsifixed | 20 |
| 20. Ovary and fruit acutely 3-lobed | 8. <i>Brunsvigia</i> , <i>Hiest.</i> |
| Ovary globose or obtusely 3-lobed | 21 |
| 21. Ovules 1-3 in each ovary-chamber | 3. <i>Buphane</i> , <i>Herb.</i> |
| Ovules several (5-6) in each ovary-chamber | 22 |
| 22. Ovary narrowed into a neck | 15. <i>Ammocharis</i> , <i>Herb.</i> |
| Ovary not narrowed into a neck | 23 |
| 23. Peduncle hollow | 16. <i>Cyrtanthus</i> , <i>Ait.</i> |
| Peduncle solid | 24 |
| 24. Perianth-tube 0 or very short ; ovary obtusely 3-lobed | 6. <i>Nerine</i> , <i>Herb.</i> |
| Perianth-tube distinct ; segments longer than or about as long as the tube | 25 |
| 25. Leaves contemporary with the flowers ; perianth-tube long, narrow below | 14. <i>Crinum</i> , <i>Linn.</i> |
| Leaves produced before the flowers ; perianth-tube short and wide | 7. <i>Amaryllis</i> , <i>Linn.</i> |

1166

1. HESSEA, Herb.

Perianth-tube 0, or very short ; segments sub-equal, spreading, 3-nerved in the middle, longer than the tube. *Stamens* inserted at the base of the perianth-segments ; filaments filiform or flattened towards the base, sometimes connate ; anthers small, sub-globose, basifixed. *Ovary* globose, with a few superposed ovules in each chamber ; style subulate, tricuspidate at the apex. *Fruit* globose, membranous, loculicidally 3-valved. *Seeds* 1-3 in each loculus, globose, greenish.

Underground stem a bulb with membranous tunics ; leaves generally produced after the flowers, filiform, linear, or lorate ; inflorescence a few- or many-flowered umbel ; pedicels elongate ; spathe-valves 2, linear or lanceolate.

Endemic ; species 10, extending from Little Namaqualand to Natal and the Transvaal ; also extends from Graaff-Reinet to Hopetown.

1167

2. HÆMANTHUS, Linn.

Perianth-tube short, sub-cylindric ; segments equal, spreading or permanently ascending, longer than the tube. *Stamens* inserted in the throat of the perianth-tube ; filaments filiform, often longer than the perianth-segments ; anthers oblong, dorsifixed, versatile. *Ovary* globose, with the ovules solitary in each chamber or in collateral pairs ; styles filiform, minutely tricuspidate at the apex. *Fruit* globose, indehiscent, fleshy. *Seeds* black, shining, embedded in a shiny pulp, and attached to a long shiny thread.

Underground stem a tunicated bulb ; tunics fleshy ; leaves 2, broad ; inflorescence a dense capitate umbel ; peduncle compressed, more or less spotted with purple ; involucre bracts many, often fleshy and bright red, broadly ovate.

Species about 80, some in tropical Africa, one in Socotra ; 31 species in South Africa, extending from Natal and the Transvaal to Clanwilliam ; also recorded from Graaff-Reinet.

1168

3. Buphane, Herb.

Perianth-tube short, campanulate or sub-cylindric ; segments spreading, equal, longer than the tube. *Stamens* inserted in the throat of the perianth-tube ; filaments filiform ; anthers oblong, dorsifixed, versatile. *Ovary* turbinate, with 2 ovules in each chamber ; style simple, obscurely 3-lobed at the stigmatose apex. *Fruit* a membranous capsule, turbinate, loculicidally 3-valved. *Seeds* solitary, globose, bulbiform.

Underground stem a large tunicated bulb (sometimes 1 ft. in diameter); leaves ensiform or lingulate, coriaceous; inflorescence a dense umbel; peduncle stout; spathe-valves 2.

Species 4; 2 in tropical Africa; 3 in South Africa, extending from the Cape into Natal and the Transvaal; also in the central districts from Somerset East to Griqualand West.

1170

4. CLIVIA, Lindl.

Perianth-tube straight or curved, short, infundibuliform; segments connivent, much longer than the tube; the 3 outer segments narrower than the 3 inner. *Stamens* inserted in the throat of the perianth-tube; filaments filiform, about as long as the segments; anthers oblong, dorsifixed, versatile. *Ovary* globose, with 5-6 ovules in each chamber; style long, slender, tricuspidate at the stigmatose apex. *Fruit* a bright red berry. *Seeds* one or few, globose, bulbiform.

Bulb imperfect, consisting only of the dilated bases of the leaves; root-fibres very thick; leaves numerous, distichous, persistent; inflorescence a many-flowered umbel; peduncle stout; flowers reddish-yellow; spathe-valves several, unequal, green, membranous, imbricated.

Endemic; species 3, extending from Bathurst into Natal and the Transvaal.

1171

5. STRUMARIA, Jacq.

Perianth-tube 0; segments equal, spreading. *Stamens* inserted at the base of the perianth-segments; filaments filiform, usually connate and adnate to the style at the base; anthers oblong, dorsifixed, versatile. *Ovary* globose, with more than 2 ovules in each chamber; style swollen and 3-angled in the lower half, tricuspidate at the stigmatose apex. *Fruit* a globose membranous capsule, loculicidally 3-valved. *Seeds* one or few in each loculus, globose, bulbiform.

Underground stem a tunicated bulb; leaves lorate; inflorescence an umbel; peduncle slender; spathe-valves 2, small, lanceolate.

Endemic; species 7, recorded from Little Namaqualand, Van Rhynsdorp, and Calvinia.

1175

6. NERINE, Herb.

Perianth-tube 0 or very short; segments equal, falcate, more or less crisped. *Stamens* unequal, inserted at the base of the perianth-segments; filaments filiform, sub-erect or declinate, sometimes appendiculate at the base; anthers oblong, dorsifixed, versatile. *Ovary* globose, obtusely 3-lobed, with numerous ovules in each chamber; style filiform, straight or declinate, obscurely tricuspidate at the stigmatose apex. *Fruit* globose, obtusely 3-lobed, membranous, loculicidally 3-valved. *Seeds* one or few in a loculus, globose.

Bulb tunicated, not produced into a neck; leaves usually lorate, produced with or after the flowers; inflorescence a few- or many-flowered umbel; peduncle slender or robust; spathe-valves 2, lanceolate.

Endemic; species 23, fairly widely distributed; recorded from Tulbagh to Natal, the Transvaal, and O.F.S.; also in the central districts.

1176

7. AMARYLLIS, Linn.

Perianth-tube short, funnel-shaped; segments sub-equal, acute, longer than the tube. *Stamens* inserted in the throat of the perianth-tube; filaments filiform, declinate; anthers linear, dorsifixed, versatile. *Ovary* oblong, with many ovules in each chamber; style filiform; stigma capitate. *Fruit* a globose capsule, bursting irregularly. *Seeds* few, globose, bulbiform.

Bulb with fibrous-membranous tunics; leaves 7-9, produced after the flowers; inflorescence an umbel; peduncle compressed; spathe-valves 2, large, deltoid.

Endemic; species 1, found from the Cape to Riversdale.

1177

8. BRUNSVIGIA, Heist.

Perianth-tube short, cylindric; segments sub-erect or decurved, unequal, falcate, longer than the tube. *Stamens* inserted on the perianth-tube, more or less declinate; filaments filiform, unequal; anthers oblong, dorsifixed, versatile. *Ovary* turbinate, with many ovules in each chamber; style filiform, declinate; stigma capitate. *Fruit* turbinate, sharply 3-angled, narrowed gradually into the pedicel, loculicidally 3-valved. *Seeds* sub-globose, with a conspicuous funiculus.

Underground stem a large tunicated bulb; leaves produced after the flowers, lorate or lingulate; inflorescence an umbel; peduncle robust; spathe-valves 2.

Species 13; one found in tropical Africa, the remainder widely distributed in South Africa.

1178

9. VALLOTA, Herb.

Perianth-tube infundibuliform; segments equal, connivent, with a pulvinate callus at the base, equalling or longer than the tube. *Stamens* inserted on the upper part of the perianth-tube; filaments filiform; anthers oblong, dorsifixed, versatile. *Ovary* oblong, with many ovules in each chamber; style filiform, obscurely tricuspidate at the stigmatose apex. *Fruit* ovoid-oblong, obtusely angled, loculicidally 3-valved. *Seeds* black, compressed, produced into a wing at the base.

Bulb with brown membranous tunics; leaves 6-18, sub-distichous; inflorescence an umbel; peduncle slightly compressed, hollow; spathe-valves 2.

Endemic; species 1, known only from the George district.

1179

10. ANOIGANTHUS, Baker

Perianth-tube short infundibuliform; segments sub-equal, ascending, longer than the tube. *Stamens* in 2 series; 3 inserted on the perianth-tube; 3 inserted in the perianth-throat; filaments filiform; anthers oblong, deeply sagittate, basifixed. *Ovary* oblong, with many ovules in each chamber; style filiform; style-branches falcate, clavate. *Fruit* globose, membranous, loculicidally 3-valved. *Seeds* numerous, flat.

Bulb with a short neck and membranous tunics; leaves 3-4, contemporary with the flowers; inflorescence a 2-10-flowered umbel; spathe-valves 2.

Species 2; one in tropical Africa, the other extending from Natal, the Transvaal and Swaziland to East London; also found in Somerset East.

1186.

11. GETHYLLIS, Linn.

Perianth-tube long, slender, cylindric; segments spreading, acute, shorter than the tube. *Stamens* 6, 12, or 18, inserted in the throat of the perianth-tube; filaments short, sometimes bearing 2-5 anthers; anthers linear, basifixed, twisting up spirally when the flower expands. *Ovary* hidden by the spathe and amongst the sheaths of the bulb-neck, with many ovules in each chamber; style long, filiform; stigma capitate. *Fruit* clavate, succulent, indehiscent, coloured, highly aromatic.

Bulb usually with a neck; leaves generally contemporary with the fruit, produced after the flowers; flowers solitary, delicate, fugitive; spathe monophyllous, membranous, amplexicaul, clasping the ovary and the lower part of the perianth-tube.

Endemic; species 10, extending from Little Namaqualand to Uitenhage; also found in Graaff-Reinet.

1186a

12. KLINGIA, Schönl.

Perianth-tube long, slender, scarcely dilated at the apex; segments in 2 series, sub-equal. *Stamens* inserted in the perianth-throat, much shorter than the segments; filaments united below into a conspicuous cup; anthers basifixed, spirally twisted as the flower opens. *Style* filiform, scarcely as long as the perianth-tube; stigma simple.

Underground stem a tunicated bulb; leaves numerous, narrowly-linear, dilated at the base; flower solitary.

Endemic; species 1, found in Namaqualand.

1187

13. APODOLIRION, Baker

Perianth-tube long, cylindric, rather dilated at the apex; segments sub-equal, ascending, shorter than the tube. *Stamens* in 2 series; 3 inserted in the throat of the perianth-tube; 3 inserted below the throat; filaments filiform; anthers linear, basifixed, about as long as the filaments. *Ovary* hidden down amongst the sheaths of the bulb-neck, with numerous ovules; style filiform, obscurely lobed at the stigmatose apex. *Fruit* and *seeds* unknown.

Bulb usually with a neck; leaves usually produced after the flowers, linear or lanceolate; flowers solitary.

Endemic; species 6, extending from Swellendam to Natal and the Transvaal; also recorded from Graaff-Reinet.

1189

14. CRINUM, Linn.

Perianth-tube cylindric; segments equal, connivent, about as long as the tube. *Stamens* inserted in the throat of the perianth-tube; filaments filiform, declinate; anthers linear, dorsifixed, versatile. *Ovary* oblong, with many ovules in each chamber; style filiform; stigma capitate. *Fruit* globose, bursting irregularly.

Bulb large, tunicated; leaves linear or lorate, persistent; inflorescence an umbel; spathe-valves 2.

Species over 120, spread through the tropical and warm-temperate regions of both the Old and New Worlds; 10 species in South Africa, extending from Little Namaqualand through the coastal districts to Natal and the Transvaal; rare in the central districts.

1190

15. AMMOCHARIS, Herb.

Perianth-tube short, cylindric; segments equal, ascending, longer than the tube. *Stamens* inserted in the throat of the perianth-tube, erect, about as long as the segments; filaments filiform, equally divergent; anthers linear-oblong; dorsifixed, versatile. *Ovary* narrowed into a distinct neck, with many ovules in each chamber; style filiform, a little longer than the perianth-segments; stigma capitate.

Bulb large, tunicated; leaves many, distichous, produced before the flowers; inflorescence a many-flowered umbel; spathe-valves 2.

Endemic; species 2, with a wide distribution.

1191

16. CYRTANTHUS, Ait.

Perianth-tube long, narrow, gradually dilated upwards; segments sub-equal, 2-3 times shorter than the tube. *Stamens* inserted on the perianth-tube; filaments filiform, sometimes very short; anthers oblong, dorsifixed, versatile. *Ovary* with many ovules in each chamber; style long, filiform, indistinctly or distinctly 3-lobed at the stigmatose apex. *Fruit* oblong, loculicidally 3-valved. *Seeds* flattened.

Underground stem a tunicated bulb ; leaves persistent, linear or lorate ; inflorescence an umbel of few or many flowers, rarely only 1 flower ; peduncle hollow ; spathe-valves 2-4.

Species 35 ; 2 species found in tropical Africa ; the remainder chiefly in the coastal belt from Caledon to Natal ; also found in the Transvaal.

1202

17. PANCRATIUM, Linn.

Perianth-tube cylindric, funnel-shaped at the apex ; segments equal, spreading. *Stamens* inserted in the throat of the perianth-tube ; filaments united in a conspicuous cup at the base ; anthers linear, versatile. *Ovary* with many ovules in each chamber ; style long, filiform ; stigma capitate, obscurely 3-lobed. *Fruit* a loculicidal capsule. *Seeds* angled by pressure.

Underground stem a bulb ; leaves linear or lorate ; inflorescence an umbel ; peduncle solid ; spathe-valves 2.

Species about 14, spread through the sub-temperate and tropical regions of the Old World ; 1 species recorded from the Transvaal (Messina).

1229a

18. FORBESIA, Eckl.

(under *Curculigo*, Gaertn.)

Perianth 6-partite ; tube very short or none ; segments sub-equal, spreading, lanceolate or sub-oblong, sub-acute. *Stamens* more or less equal, fixed to the base of the perianth-segments or in the throat of the perianth-tube ; filaments short, subulate or filiform ; anthers adnate to the filaments at the back, sagittate at the base, much longer than the filaments. *Ovary* cylindric, produced at the apex into a filiform beak, sessile or stalked, with many ovules in each chamber ; style subulate ; stigmas 3, usually shorter than the style. *Fruit* succulent, indehiscent. *Seed* sub-globose, black ; embryo small ; endosperm fleshy.

Glabrous acaulescent herbs ; rhizome or corm sub-discoid ; leaves grass-like, radical, linear, acute, ribbed ; flowers solitary, yellow.

Endemic ; species 6, extending from S.W. Africa to Natal.

1230

19. HYPOXIS, Linn.

Perianth-segments 6 (very rarely less than 6), more or less hairy on the outer surface ; outer segments linear to lanceolate, sub-acute ; inner segments oval or sub-orbicular, sub-obtuse. *Stamens* attached to the base of the perianth-segments ; anthers basifixed, linear or lanceolate, sagittate at the base. *Ovary* club-shaped or top-shaped ; style cylindric or very short and expanded at the base ; stigmas 3, sometimes sub-sessile. *Fruit* a capsule ; seeds somewhat round, usually black, shining, sometimes warty or spiny.

Underground stem a tuber or corm ; leaves radical, usually about 6, very rarely up to 20, linear, lanceolate or linear-lanceolate, rarely filiform, strongly ribbed, more or less hairy, rarely glabrous ; inflorescence usually a raceme, rarely flowers solitary or only 2.

Species about 88, mostly African ; 2 species found in the Malay Archipelago, Japan, and Formosa ; 3 species in North and South America ; 41 species described from South Africa with general distribution, but absent from the central districts except towards the east.

1230a

20. IANTHE, Salisb.

(under *Hypoxis*, Linn.)

Perianth-segments 6, in 2 whorls, free down to the ovary, lanceolate or linear ; outer broader than the inner. *Stamens* 6 (very rarely 7), attached to the base of the perianth-segments ; filaments attached to the back of the

anthers, subulate or filiform ; anthers linear, often produced into a globose gland at the apex. *Ovary* mostly club-shaped, sometimes linear or cylindric, mostly short, rarely longer than the stigmas, narrowed above ; stigmas 3. *Fruit* a capsule.

Underground stem a corm ; leaves radical, usually narrow, sessile, entire, very rarely serrate, with indistinct veins ; flowering scapes one or more to each corm ; flowers usually several, more rarely solitary.

Endemic ; species 17, extending from Little Namaqualand to Albany ; mostly massed in the south-western districts.

1230b

21. RHODOHYPOXIS, Nel

Perianth-tube 6-partite ; tube short, sub-funnel shaped, densely pilose without ; segments glabrous or sub-glabrous without, elliptic, oblong, or oval, clawed, obtuse or sub-acute. *Stamens* 6, affixed to the perianth-tube in 2 rows ; filaments very short or none ; anthers sub-sessile, minute, oblong, basifixed, produced into a sub-globose gland. *Ovary* shortly turbinate, very rarely produced into a short beak or constricted at the neck ; stigma minute, sub-sessile, sub-capitate.

Tuber oblong, covered with white bristles (the remains of old leaves) ; leaves radical, erect, sparsely covered with white stellate bristles on both sides, prominently 2-nerved ; flowers solitary or 2-nate, long-pedicelled, rosy, rosy-white, very rarely white ; pedicels densely covered with white stellate bristles ; floral bracts solitary, setaceous, sometimes two opposite bracts above the middle of the scape.

Endemic ; species 2, confined to East Griqualand, Natal, Basutoland, and the eastern O.F.S.

1231

22. WALLERIA, Kirk.

Perianth-tube short, campanulate ; segments equal, spreading, many-nerved, longer than the tube. *Stamens* inserted in the throat of the perianth-tube ; filaments very short, filiform ; anthers basifixed, lanceolate, connivent in a cone, dehiscing by apical pores. *Ovary* free, but included in the perianth-tube, globose, with many ovules ; styles subulate ; stigma capitate.

Rootstock tuberous ; leaves sessile, linear or oblong-lanceolate ; flowers axillary.

Species 3 or 5, or probably varieties, known from Angola, the Zambesi Highlands, and Madagascar ; one of these found in the Transvaal.

1233

23. CYANELLA, Linn.

Perianth-tube 0 ; segments unequal, laxly nerved. *Stamens* inserted at the base of the segments, unequal ; filaments short ; anthers dehiscing by terminal pores. *Ovary* half inferior, with numerous ovules ; style filiform ; stigma minutely 3-lobed. *Fruit* a loculicidal capsule. *Seeds* ovoid, turgid.

Underground stem a corm with matted fibrous tunics ; leaves mostly in a basal rosette, terete or linear, persistent ; inflorescence usually a raceme ; bracts persistent.

Endemic ; species 7, extending from Namaqualand to Albany ; also recorded from Bechuanaland, Basutoland, and Somerset East.

1236

24. LANARIA, Ait.

Perianth-tube short ; segments sub-equal. *Stamens* inserted in the throat of the perianth-tube ; filaments filiform, shorter than the segments ; anthers small, ovate, sagittate at the base. *Ovary* half inferior, with 2 ovules in each chamber ; style filiform ; stigma capitate. *Fruit* sub-globose, crowned by the persistent perianth, 1-locular, 1-seeded. *Seeds* globose.

Rootstock woody; leaves several in a basal rosette; inflorescence a dense panicle with scorpioid cymose branches, densely covered with plumose hairs. Endemic; species 1, extending from Riversdale to Albany.

28. VELLOZIACEÆ.

Flowers regular, bisexual. *Perianth* of 6 segments, cut to the top of the ovary, or joined below to form a distinct tube. *Stamens* 6 to many. *Ovary* inferior, 3-chambered, with many ovules in each chamber on projecting placentas; style simple; stigma 3-lobed. *Fruit* a capsule. *Seeds* black, compressed; endosperm present.

Plants with often branched woody stems; leaves crowded at the apex of the stem; flowers solitary or few, between the fascicle of leaves.

Genera 2; species about 80, found in Africa, Madagascar, and Brazil.

1246

1. VELLOZIA, Vand.

Perianth-segments cut down to the top of the ovary, otherwise with characters of the family.

Species over 50, found in Africa, Madagascar, and Brazil; 11 species in South Africa, found in Natal and the Transvaal; several of these extend into tropical Africa.

29. DIOSCOREACEÆ.

Plants dioecious, rarely monoecious. *Flowers* regular, in a few abnormal genera the flowers bisexual. *Perianth* 6-merous in 2 rows. *Male flowers*: *Perianth* often campanulate, 6-fid, with the lobes in 2 rows. *Stamens* inserted near the base of the perianth-segments, sometimes 6, all perfect or the alternate variously reduced to staminodes, sometimes only 3 stamens; filaments much shorter or scarcely shorter than the perianth-segments, or in the central flowers connate into a very short column; anthers small. *Ovary* rudimentary or quite absent. *Female flowers*: *Perianth* 6-fid or 6-partite, persistent. *Staminodes* small, 3-6 often present. *Ovary* inferior, linear or oblong, 3-angled, 3-chambered, with 2 pendulous ovules in each chamber; styles 3, very short, distinct or connate in a short column; stigmas 3, entire or 2-fid. *Fruit* a 3-valved capsule or an indehiscent berry. *Seed* plano-compressed or globose; endosperm fleshy.

Plants normally with tuberous rhizomes; rhizomes thick, fleshy, either below the ground or partly above the ground, often almost woody; stems slender, twining, or high climbers, or rarely abbreviated; leaves alternate or sometimes almost opposite, petioled, often cordate, digitately 3 to many-nerved, entire, lobed at the base or digitately 3 to many-lobed, sometimes with tendrils; inflorescence a spike or raceme; flowers small, sessile or variously pedicelled; bracts small, often minute, or 0.

Genera 10, by some authors reduced to 8, with over 100 species, found in all warm regions.

Tubers beneath the ground 1. *Dioscorea*, Linn.

Tubers partly above the ground, large, woody. 2. *Testudinaria*, Salisb.

1252

1. DIOSCOREA, Linn.

Plants dioecious, rarely monoecious. *Male flowers*: *Perianth* of 6 connate segments in 2 rows. *Stamens* sometimes 6, sometimes connate in a short column in the central flowers. *Ovary* rudimentary, thick, fleshy, or 0.

Female flowers : *Perianth* of 6 distinct segments. *Staminodes* 3-6, small, or 0. *Ovary* 3-angled ; styles 3, very short ; stigmas terminal, entire or 2-fid. *Fruit* a 3-angled capsule, with the angles or lobes very prominent or almost winged. *Seed* much compressed.

Tubers beneath the ground ; stems twining, high climbers or rarely procumbent ; leaves alternate or sometimes opposite ; inflorescence as described for the family.

Species over 400, but probably not all true species, widely dispersed ; 15 species recorded from South Africa, extending from Natal and the Transvaal to George.

1252a

2. TESTUDINARIA, Salisb.

Plants dioecious. *Male flowers* : *Perianth* broadly campanulate, 6-fid. *Stamens* 6, inserted below the middle of the perianth ; anthers small. *Style* rudimentary. *Female flowers* : *Perianth-segments* small, distinct. *Staminodes* small. *Ovary* ovoid or oblong ; style very short ; stigmas 2-lobed. *Fruit* a 3-angled capsule, with the angles very prominent or almost winged. *Seeds* much compressed.

Tubers partly above the ground, large, hemispherical, fleshy or woody, with raised square areas ; stem slender, twining, high climbers ; leaves alternate ; flowers small, in axillary racemes.

Species 5 ; 4 species in South Africa, extending from Natal and the Transvaal to Humansdorp ; also recorded from Graaff-Reinet and Somerset East ; 1 species described from Brazil.

30. IRIDACEÆ.

Flowers bisexual, regular or irregular. *Perianth-tube* cylindric or funnel-shaped, or abruptly dilated, more rarely 0 ; segments longer or shorter than the tube. *Stamens* 3, opposite the outer lobes of the perianth, unilateral or equilateral ; filaments short or elongated, straight or arcuate, sometimes flattened, free or connate ; anthers 2-theous, dehiscent extrorsely or down the margin. *Ovary* inferior, almost invariably 3-chambered, usually with many superposed ovules in each chamber, rarely ovules only 2-3 ; style filiform ; style-branches 3, filiform, subulate, or flattened, sometimes petaloid, entire, or bifid, more rarely the style minutely tricuspidate. *Fruit* a 3-locular capsule, with loculicidal dehiscence. *Seeds* globose, angled, or discoid, sometimes winged ; endosperm horny ; embryo minute.

Perennial herbs, with underground stems, very rarely annual herbs or undershrubs ; underground stem a corm, rarely creeping or woody ; leaves narrow, sessile, firm in texture and persistent, often equitant and distichous, often in a basal rosette ; inflorescence a simple or branched spike, corymb, or panicle ; flowers one or more to each spathe, sometimes fugitive ; spathe-valves green and herbaceous, brown, or membranous, sometimes lacerated.

Almost 60 genera with nearly 700 species found in the temperate regions of both hemispheres. Over half of the known species occur in South Africa.

Sub-family Crocoideæ. Stemless ; the leaves generally all radical, not equitant ; flowers either sessile in the rosette of leaves, the perianth-tube and limb only exserted, or borne on a simple scape or a few-branched peduncle, the flower in each case supported by a bivalved spathe.

Tribe Galaxiæ : Characters of the sub-family (genera 1-3).

Sub-family Iridoideæ. Plants more or less caulescent ; flowers in more or less compound mostly corymbose inflorescences, regular, several emerging in succession from a many-valved spathe.

- Tribe **Moraeæ**: Perianth without a tube or nearly so; capsule not enclosed in the spathe; style-branches expanded, covering the stamens (genera 4-7).
 Tribe **Sisyrinchieæ** as in tribe **Moraeæ** but style-branches subulate, undivided, spreading (genus 8).
 Tribe **Aristeæ**: Perianth with a distinct tube; capsule enclosed in the spathe (genera 9-13).
 Tribe **Ixiæ**: Flowers regular or nearly so; style-branches undivided (genera 14-19).
 Tribe **Gladiolæ**: Flowers distinctly zygomorphic; the perianth-tube mostly curved; style-branches undivided (genera 20-27).
 Tribe **Watsoniæ**: Style-branches 3, bifid (genera 28-32).

1. Stems tall and woody, with the remains of old leaves. 2
 Stems not woody; often stemless plants 4
2. Flowers fugacious; perianth twisting spirally when the flower fades 12. *Nivenia*, Vent.
 Flowers not fugacious, not twisting spirally when faded 3
3. Perianth-tube very short, almost 0; segments long and linear 13. *Klattia*, Bkr.
 Perianth-tube much longer than the segments; segments ovate-lanceolate 11. *Witsenia*, Thunb.
4. Filaments connate 5
 Filaments free 10
5. Style-branches simple or forked, filiform or flattened, but not petaloid 6
 Style-branches petaloid 7
6. Style-branches forked 6. *Hexaglottis*, Vent.
 Style-branches simple 17. *Ixia*, Linn.
7. Perianth-segments very much crisped; style-branches ciliate 5. *Ferraria*, Linn.
 Perianth-segments not crisped 8
8. Perianth-tube 0 or very short; style-branches with a bi-lobed crest 9
 Perianth-tube cylindric; style-branches without a bi-lobed crest 3. *Galaxia*, Thunb.
9. Perianth-segments more or less distinctly clawed; the 3 inner segments smaller; stigmatose tissue on lower side at base of the crest 4. *Moræa*, Linn.
 Perianth-segments not or hardly clawed, sub-equal, or the 3 inner narrower; stigmatose surface terminal on the style-branches 7. *Homeria*, Vent.
10. Style-branches petaloid 4. *Moræa*, Linn.
 Style-branches entire or divided, not petaloid 11
11. Style-branches bifid 12
 Style-branches entire, or style minutely tricuspidate, or style simple 17
12. Ovules 2-3 in each ovary-chamber 28. *Micranthus*, Pers.
 Ovules many, superposed 13
13. Perianth-tube shorter than the segments 14
 Perianth-tube longer than the segments 15
14. Flowers solitary 2. *Romulea*, Maralt
 Inflorescence a lax panicle of cymes 29. *Pillansia*, L. *Bolus*
15. Perianth-tube sub-cylindric, slightly dilated upwards; stamens inserted in the throat of the perianth; filaments very short 30. *Lapeyrousia*, Pourr.
 Perianth-tube funnel-shaped; stamens inserted below the perianth-throat; filaments elongate 16
16. Inflorescence a simple or branched spike; spathe-valves moderately large, rigid, brown or herbaceous 31. *Watsonia*, Mill.
 Inflorescence a lax secund spike with a flexuose rachis; spathe-valves small, green, membranous above 32. *Freesia*, Klatt
17. Spathes more than 1-flowered; flowers fugacious 18
 Spathes 1-flowered; flowers not fugacious 20
18. Perianth-segments unequal; the 3 inner segments larger than the 3 outer 9. *Cleanthe*, Salisb.
 Perianth-segments equal or sub-equal 19

19. Perianth-tube 0 ; flowers yellow, not twisting spirally when faded ; capsule not enclosed in the spathe 8. *Bobartia*, Ker
 Perianth-tube short ; flowers blue, twisting spirally when faded ; capsule enclosed in the spathe 10. *Aristea*, Soland.
20. Style-branches long, as long as or almost as long as the style 21
 Style-branches very much shorter than the style 22
21. Plants with a short underground rhizome, not a corm 14. *Schizostylis*, Backh. & Harv.
 Plants with corms 16. *Hesperantha*, Ker
22. Perianth-tube 0 ; segments very long, acuminate 20. *Melaspheerula*, Ker
 Perianth-tube long or short ; segments obtuse, acute, sometimes shortly acuminate 23
23. Spathe-valves lacerated 24
 Spathe-valves entire or emarginate 26
24. Stamens equilateral 19. *Streptanthera*, Sweet
 Stamens unilateral 25
25. Perianth more or less regular ; segments longer than the tube 22. *Sparaxis*, Ker
 Perianth irregular ; segments shorter than the tube 24. *Synnotia*, Sweet
26. Perianth-tube abruptly dilated 27. *Antholyza*, Linn.
 Perianth-tube cylindric or funnel-shaped 27
27. Stamens equilateral 28
 Stamens unilateral 31
28. Spathe-valves membranous, acuminate ; inflorescence a lax panicle ; grass-like plants 18. *Dierama*, C. Koch
 Spathe-valves green or brown, not membranous and acuminate ; inflorescence a simple or branched spike, or flowers solitary 29
29. Flowers solitary, sessile in the centre of a rosette of leaves 1. *Syringodea*, Hook. fil.
 Inflorescence a branched or simple spike, rarely flowers solitary 30
30. Spathe-valves green ; herbaceous, with a brown membranous edge 15. *Geissorhiza*, Ker
 Spathe-valves brown, emarginate 17. *Ixia*, Linn.
31. Leaves plicate, strongly ribbed, mostly hairy 25. *Babiana*, Ker
 Leaves not plicate 32
32. Perianth irregular, with a funnel-shaped tube 26. *Gladiolus*, Linn.
 Perianth sub-regular with a cylindric tube 33
33. Spathe-valves brown 21. *Tritonia*, Ker
 Spathe-valves, green, herbaceous 23. *Acidanthera*, Hochst.

1260

1. SYRINGODEA, Hook. f.

Perianth-tube long, cylindric, exerted from the spathe ; segments sub-equal, entire or emarginate. *Stamens* inserted in the throat of the perianth-tube, alternating with the style-branches ; filaments short ; anthers sagittate at the base. *Ovary* oblong-cylindric ; chambers with many ovules ; style long, filiform ; style-branches clavate. *Capsule* membranous. *Seeds* minute.

Stemless plants ; corm with many membranous tunics ; leaves forming a basal rosette ; spathes 1-flowered, sessile in the centre of the rosette of leaves.

Endemic ; species 10, mainly in the western and central districts, recorded from Little Namaqualand and also from Albany.

1261

2. ROMULEA, Maratti

Perianth-tube shorter than the spathe ; segments sub-equal, imbricate. *Stamens* inserted in the throat of the perianth-tube, alternating with the style-branches ; filaments short ; anthers sagittate at the base. *Ovary* with numerous ovules in each chamber ; style cylindric ; style-branches 3,

with each branch divided into 2 clavate or flattened lobes. *Capsule* globose or ellipsoid, loculicidally 3-valved. *Seeds* globose or angled by pressure.

Stemless plants; corm with tunicated membranous brown coats; leaves linear; scapes simple or slightly branched; spathe of 2 lanceolate valves; flowers solitary in the spathe.

Species described about 120; many Mediterranean, a few central European, 2 tropical African; 40 species described from South Africa, ranging from Little Namaqualand to Natal; mainly south-western, but several species found in the central districts.

1262

3. GALAXIA, Thunb.

Perianth-tube cylindric; segments sub-equal. *Stamens* inserted in the throat of the perianth-tube, alternating with the style-branches; filaments connate; anthers sagittate. *Ovary* cylindric, with many ovules in each chamber; style filiform; style-branches petaloid, overtopping the anthers. *Capsule* cylindric, membranous. *Seeds* minute.

Stemless plants; corm tunicated with parallel lamellae; leaves in a basal rosette; spathe 1-flowered; flower very fugacious.

Endemic; species 4, recorded from Clanwilliam to Riversdale.

1265

4. MORÆA, Linn.

Perianth-tube 0; segments unequal, more or less distinctly clawed; the 3 inner segments always smaller than the outer. *Stamens* opposite the style-branches and adpressed to them; filaments nearly always more or less connate; anthers linear. *Ovary* obtuse or beaked, with many ovules in each chamber; style-branches large and petaloid, with a large bi-lobed crest; the stigmatose tissue on the lower side at the base of the crest. *Capsule* ovoid or ellipsoid, dehiscing loculicidally, not enclosed in the spathe. *Seeds* ovoid or sub-globose, often angled by pressure.

Underground stem usually a tunicated corm, very rarely a rhizome; leaves usually linear, sometimes forming a distichous rosette; spathes cylindric, more than 1-flowered; flowers fugacious.

Species about 90, found in Africa, Madagascar, and Australia; 61 species recorded from South Africa, fairly generally distributed, ranging from Little Namaqualand to Natal and the Transvaal; absent from the greater part of the central districts.

1272

5. FERRARIA, Linn.

Perianth-tube very short; segments sub-equal, clawed, spreading, much crisped on the margins. *Stamens* opposite the style-branches and adpressed to them; filaments connate or connivent in a cylindric tube. *Ovary* cylindric or more or less 3-angled, with numerous ovules; style filiform inside the staminal-tube; style-branches petaloid, small, bifid, densely ciliate on the edge. *Capsule* ellipsoid, membranous, acute or beaked, not enclosed in the spathe. *Seeds* globose, angled by pressure.

Underground stem a large tuber-like corm; leaves few, linear, distichous, passing gradually into ovate amplexicaul bracts; spathes cylindric, more than 1-flowered; flowers fugacious.

An African genus of 12 species; 6 species in South Africa, recorded from Clanwilliam to Uitenhage; also recorded from Victoria West.

1273

6. HEXAGLOTTIS, Vent.

Perianth-tube 0; segments sub-equal, twisting up spirally in fading. *Stamens* opposite the style-branches; filaments very short, flattened, connivent in

a tube. *Ovary* cylindric, with many ovules ; style short ; style-branches deeply forked into filiform segments. *Capsule* cylindric, not enclosed in the spathe. *Seeds* minute.

Underground stem a small tunicated corm ; produced leaves usually 2, linear or terete ; inflorescence 3-4 to a spathe, fugacious.

Endemic ; species 2, ranging from Clanwilliam to Uitenhage.

1277

7. HOMERIA, Vent.

Perianth-tube 0, or very short ; segments sub-equal or the three inner narrower, not or hardly clawed. *Filaments* connate into a tube ; anthers sessile on the staminal-tube, opposite the style-branches, linear. *Ovary* clavate, with numerous ovules ; style filiform ; style-branches small, petaloid, bi-lobed, mucronate, papillose on the margin and bearing a short bi-lobed petaloid crest of equal length. *Capsule* splitting at the apex only, not enclosed in the spathe. *Seeds* small, angled by pressure.

Underground stem a tunicated corm ; produced leaf usually only one, linear, overtopping the stem ; inflorescence corymbose, of one or few clusters of flowers ; spathe cylindric ; flowers fugacious.

Endemic ; species 15, fairly generally distributed over the Union, recorded from Caledon to Natal and the Transvaal and also from the central and western districts.

1284

8. BOBARTIA, Ker

Perianth-tube 0 ; segments equal, spreading. *Stamens* inserted at the base of the perianth-segments ; filaments short, flattened ; anthers sagittate. *Ovary* top-shaped, 3-angled, with numerous ovules ; style short, 3-angled ; style-branches subulate, spreading. *Capsule* firm, splitting at the apex, not enclosed in the spathe.

Tufted plants with short stout rhizomes, very rarely a corm present ; leaves rigid, terete or ensiform ; inflorescence a head of 1 to several flowers, usually overtopped by a rigid bract ; flowers more than one to a spathe, fugacious, pale yellow.

Endemic ; species 11, mainly in the south-western districts, but also recorded from Natal.

1294

9. CLEANTHE, Salisb.

Perianth-tube very short ; segments spreading, twisting up spirally after flowering ; the 3 inner segments larger than the 3 outer. *Stamens* inserted at the base of the perianth-segments ; filaments short. *Ovary* cylindric, 3-angled, with many ovules ; style cylindric ; style-branches small, cuneate. *Capsule* cylindric, 3-angled, enclosed in the spathe. *Seeds* small.

Rootstock short ; stem with 1-2 rudimentary leaves ; leaves upright in a dense basal distichous rosette, linear ; inflorescence a lax corymb of flower-clusters ; clusters 2-3-flowered ; flowers fugacious.

Endemic ; species 1, recorded only from the Paarl district.

1295

10. ARISTEA, Soland.

Perianth-tube short, cylindric ; segments sub-equal, spreading, shorter than the tube, twisting up spirally after flowering. *Stamens* inserted in the throat of the perianth-tube ; filaments short. *Ovary* oblong or clavate, with many ovules ; style filiform ; style-branches very short, spreading, flattened, stigmatose round the edges. *Capsule* rigid, loculicidally 3-valved, oblong or cylindric, enclosed in the spathe. *Seeds* small, globose, or angled by pressure.

Underground stem never a bulb; leaves in a distichous basal rosette; inflorescence a pseudo-umbel or a raceme; flowers blue, in clusters, fugacious; outer-bracts wholly or partially firm in texture; inner-bracts membranous, brown or white, often lacerated.

Species about 40, natives of Africa and Madagascar; 23 species in South Africa, extending from Natal and the Transvaal to Capetown.

1296

11. WITSENIA, Thunb.

Perianth-tube long (2 inches), gradually dilated upwards, exerted from the spathe; segments connivent, ovate-lanceolate; the 3 outer segments pilose on the back. *Stamens* inserted in the throat of the perianth-tube; filaments flat; anthers lanceolate, sagittate. *Ovary* oblong, crowned with an annular gland; style filiform, minutely tricuspidate at the apex. *Capsule* hard in texture, loculicidally 3-valved, enclosed in the spathe. *Seeds* few, angled.

Stem woody, branched; leaves distichous, ensiform; inflorescence a terminal head; involucre of closely imbricated rigid yellow glossy bracts; flowers yellow below, blue above, scented.

Endemic; species 1, recorded only from the Caledon, Cape, and Swellendam districts.

1297

12. NIVENIA, Vent.

Perianth-tube long, cylindric, exerted from the spathe; segments equal, shorter than the tube, spirally twisted after flowering. *Stamens* inserted in the throat of the perianth-tube. *Ovary* oblong or clavate, with many ovules; style filiform; style-branches very short, spreading, flattened, stigmatose round the edges. *Capsule* rigid, oblong, loculicidally 3-valved, enclosed in the spathe. *Seeds* small, angled by pressure.

Stems half woody, branched, leafy; leaves linear, distichous, amplexicaul; inflorescence corymbose, of 1 or many clusters of flowers; spathes more than 1-flowered; outer-bracts rigid; inner-bracts membranous; flowers blue, fugacious.

Endemic; species 2, ranging from Caledon to the Zwartberg Pass between Oudtshoorn and Prince Albert.

1298

13. KLATTIA, Baker

Perianth-tube very short; segments equal, with a very long linear claw and a short narrow-lanceolate blade. *Stamens* inserted in the throat of the perianth-tube; filaments long, filiform; anthers sagittate at the base. *Ovary* turbinate, with few ovules in each chamber; style filiform, minutely tricuspidate at the apex. *Capsule* loculicidally 3-valved, enclosed in the spathe. *Seeds* 1 or few in each loculus, angular or compressed.

Stem woody, branched; leaves distichous, rigid; inflorescence a dense head; bracts large, lanceolate, rigid; spathes 1-2-flowered.

Endemic; species 2, found from Caledon to Riversdale.

1299

14. SCHIZOSTYLIS, Backh. et Harv.

Perianth-tube cylindric, long (1-1½ inches); segments oblong, acute. *Stamens* inserted in the throat of the perianth-tube; filaments filiform, longer than the anthers; anthers basifixed. *Ovary* clavate, with numerous ovules; style as long as the perianth-tube; style-branches spreading, subulate, almost as long as the style.

Plants with rhizomes (not corms); leaves few, distichous, grass-like; inflorescence a lax equilateral spike; spathe-valves large, lanceolate, green.

Endemic; species 2, found from Natal to Stockenström; also in the Transvaal and O.F.S.

1300

15. GEISSORRHIZA, Ker

Perianth-tube cylindric; segments sub-equal, spreading. *Stamens* inserted in the throat of the perianth-tube; filaments filiform; anthers basifixed. *Ovary* oblong, with numerous ovules; style longer than the perianth-tube; style-branches entire, falcate, subulate, shorter than the style. *Capsule* membranous, loculicidally 3-valved. *Seeds* globose, or angled by pressure.

Corm tunicated; leaves few, narrow, distichous; inflorescence a simple or branched spike, rarely flowers solitary; outer spathe-valves generally green and herbaceous, with a brown membranous edge.

Species 42; one species in central Madagascar, otherwise all South African; distributed from Little Namaqualand to East Griqualand; also in the Transvaal, but mostly massed in the south-western districts.

1301

16. HESPERANTHA, Ker

Perianth-tube cylindric; segments sub-equal, spreading. *Stamens* inserted in the throat of the perianth-tube; filaments short. *Ovary* with numerous ovules; style as long as the perianth-tube; style-branches subulate, falcate, entire, as long as or longer than the style. *Capsule* membranous, loculicidally 3-valved. *Seeds* small, globose, or angled by pressure.

Corm tunicated; leaves few, narrow, distichous; inflorescence a lax spike; spathe-valves herbaceous, about as long as the perianth-tube.

Species 37; four species in tropical Africa, the remainder South African; distributed from Little Namaqualand to Natal, the O.F.S., and the Transvaal; rare in the central districts.

1302

17. IXIA, Linn.

Perianth-tube usually short, cylindric, sometimes dilated above; segments sub-equal, spreading. *Stamens* inserted in the throat of the perianth-tube; filaments free, very rarely connate; anthers sagittate at the base. *Ovary* oblong, with numerous ovules; style filiform, exerted from the perianth-tube; style-branches falcate, spreading, shorter than the style. *Capsule* membranous, loculicidally 3-valved. *Seeds* globose, or angled by pressure.

Corms with fibrous tunics; leaves few, linear, distichous; inflorescence a simple or branched spike; spathe-valves brown, emarginate.

Species 25; 1 in tropical Africa; remainder South African, mainly massed in the south-western districts, but extend from Clanwilliam to Natal.

1303

18. DIERAMA, C.Koeh

Perianth-tube short, cylindric, dilated at the throat; segments sub-equal, ascending. *Stamens* inserted in the throat of the perianth-tube; filaments short; anthers sagittate. *Ovary* oblong, with numerous ovules; style longer than the perianth-tube; style-branches entire, clavate, spreading, much shorter than the style. *Capsule* small, membranous, loculicidally 3-valved. *Seeds* small, globose, or angled by pressure.

Corms with dry coats of parallel fibres; stems tall; leaves grass-like, rigid, linear, distichous; inflorescence a panicle; spathe-valves membranous, acuminate.

An African genus of 3 species; 2 species in South Africa, extending from Humansdorp to Natal and the Transvaal.

1304

19. STREPTANTHERA, Sweet

Perianth-tube short, funnel-shaped; segments equal, obovate. *Stamens* inserted in the throat of the perianth-tube; filaments flattened. *Ovary* with many ovules; style filiform, reaching to the top of the filaments; style-branches entire, clavate, spreading, shorter than the style. *Capsule* sub-globose, membranous. *Seeds* small, sub-globose.

Corm with fibrous tunics; leaves short, arranged in a fan-shaped rosette; inflorescence a 2-3-flowered spike; spathe-valves large, membranous, lacerated.

Endemic; species 2, only known from the Tulbagh district.

1305

20. MELASPHÆRULA, Ker

Perianth-tube 0; segments unequal, narrowed into a filiform apex. *Stamens* inserted at the base of the perianth-segments; filaments arcuate; anthers versatile. *Ovary* 3-lobed, with 2-3 ovules in each chamber; style shorter than the perianth-segments; style-branches filiform, shorter than the style. *Fruit* membranous, deeply and acutely angled, loculicidally 3-valved. *Seeds* oblong, thickened and spongy at the top.

Corm with thin brown tunics; leaves in a distichous basal rosette, linear-thin in texture; inflorescence a lax panicle; spathe-valves herbaceous.

Endemic; species 1, extending from Clanwilliam to Uitenhage.

1306

21. TRITONIA, Ker

(*Crocasmia*, Planch.)

Perianth-tube cylindric below, funnel-shaped above, varying in length; dilated above; segments equal or unequal, blunt or shortly acuminate. *Stamens* inserted near the throat of the perianth-tube, unilateral; filaments arcuate; anthers usually versatile. *Ovary* with few to many ovules; style filiform; style-branches spreading, sometimes slightly dilated at the tip; shorter than the style. *Fruit* membranous or sub-chartaceous, sometimes inflated and 3-lobed. *Seeds* globose, or angled by pressure.

Corm with fibrous reticulated rarely thin membranous tunics; basal leaves in a fan-like rosette, linear or ensiform; inflorescence a simple or branched spike; spathe-valves brown, dentate at the tip.

Species about 55, all African; 41 species in South Africa, mainly in the south-western districts, but extending from Little Namaqualand to Natal and the Transvaal.

1307

22. SPARAXIS, Ker

Perianth-tube cylindric below, dilated into a funnel in the upper half; segments sub-equal, ascending, longer than the tube. *Stamens* inserted in the throat of the perianth-tube, unilateral. *Ovary* with many ovules; style filiform, finally exerted from the perianth-tube; style-branches subulate, falcate, shorter than the style. *Fruit* membranous, turbinate, loculicidally 3-valved. *Seeds* globose, or angled by pressure.

Corm with finely reticulated tunics; leaves in a fan-like distichous rosette; inflorescence a simple or branched spike, with few flowers; spathe-valves membranous, lacerated, wrapped round the ovary and perianth-tube.

Endemic; species 4, extending from Malmesbury to Uitenhage.

1308

23. ACIDANTHERA, Hochst.

Perianth-tube cylindric, longer than the limb; segments sub-equal. *Stamens* inserted in or a little below the throat of the perianth-tube, unilateral; filaments arcuate, filiform. *Ovary* with many ovules; style long, filiform; style-branches flattened, falcate, shorter than the style. *Capsule*

membranous, loculicidally 3-valved. *Seeds* globose or discoid, broadly winged.

Corm tunicated; leaves narrow, linear; inflorescence a lax simple few-flowered spike; spathe-valves lanceolate, entire, herbaceous.

An African genus of 27 species; 14 species in South Africa, extending from Clanwilliam through the coastal belt to Natal and the northern Transvaal.

1309

24. SYNNOTIA, Sweet

Perianth-tube long, cylindric below, broadly funnel-shaped above; segments unequal, shorter than the tube; the upper segment broadest; the other segments reflexing when the flower is expanded. *Stamens* unilateral, inserted at the base of the dilated upper part of the perianth-tube; anthers basifixed. *Ovary* with many ovules; style filiform; style-branches very short, shorter than the style. *Fruit* membranous, with loculicidal dehiscence. *Seeds* globose, or angled by pressure.

Corm with finely reticulated tunics; leaves in a fan-like distichous rosette; inflorescence a simple or branched spike, with few flowers; spathe-valves membranous, deeply lacerated.

Endemic; 4 species recorded from Clanwilliam to the Cape.

1310

25. BABIANA, Ker

Perianth-tube long, cylindric, funnel-shaped at the top; segments equal or unequal. *Stamens* unilateral, inserted near the throat of the perianth-tube; usually shorter than the segments. *Ovary* with many ovules; style filiform; style-branches usually flattened at the tip, much shorter than the style. *Fruit* membranous, loculicidally 3-valved. *Seeds* globose, or angled by pressure.

Corm tunicated; leaves plicate, strongly ribbed, mostly hairy, often distinctly petioled; inflorescence a simple or branched spike; spathe-valves various in texture, usually lanceolate, pilose, finely ribbed.

An African genus of 34 species, 1 species in Socotra; 32 species in South Africa, extending from Little Namaqualand to Uitenhage; also in the central districts and the Transvaal.

1311

26. GLADIOLUS, Linn.

Perianth-tube funnel-shaped, curved, gradually widening upwards; segments unequal; the three lower segments smaller than the three upper. *Stamens* unilateral, inserted below the throat of the corolla-tube; filaments filiform, arcuate; anthers basifixed. *Ovary* with many ovules; style filiform; style-branches cuneate at the tip, shorter than the style. *Fruit* obovoid, loculicidally 3-valved. *Seeds* discoid and winged in the South African species.

Plants varying in habit from stemless species to tall stout species 3-4 ft. high; leaves terete, linear, or ensiform; inflorescence a spike, rarely flowers solitary; spathe-valves usually large, lanceolate, herbaceous.

Species about 250, natives of Africa, Europe, the Mediterranean and Oriental regions; over 130 species recorded from South Africa, fairly generally distributed, but absent from the greater part of the central region.

1312

27. ANTHOLYZA, Linn.

Perianth-tube cylindric below, then abruptly widened; segments generally unequal. *Stamens* unilateral, inserted low down in the perianth-tube; filaments arcuate; anthers sagittate. *Ovary* with many ovules; style filiform; style-branches flattened and cuneate at the tip, shorter than the style. *Fruit* membranous, loculicidally 3-valved. *Seeds* turgid or discoid, generally winged.

Corm tunicated ; leaves generally linear or ensiform ; inflorescence a simple rarely a branched spike, very rarely flowers solitary ; spathe-valves lanceolate, entire, herbaceous or rigid in texture.

Species about 41, all African ; 21 species in South Africa, extending from Little Namaqualand to Natal and the Transvaal ; absent from the central region.

1313

28. MICRANTHUS, Pers.

Perianth-tube curved, sub-cylindric, shorter than the limb ; segments spreading, sub-equal. *Stamens* inserted in the throat of the perianth-tube, unilateral ; filaments filiform, arcuate ; anthers sagittate, versatile. *Ovary* with 2 ovules in each chamber ; style filiform ; style-branches filiform, bifid, shorter than the style. *Fruit* membranous, loculicidally 3-valved. *Seeds* 1-2 in each loculus, lanceolate.

Corm with thick reticulated tunics ; leaves sheathing the stem, superposed ; inflorescence a dense distichous spike ; outer spathe-valve with a rigid centre and a broad hyaline border ; flowers red.

Endemic ; species 2, from the Cape to Uitenhage.

1313a

29. PILLANSIA, L.Bolus

Perianth-tube shorter than the limb ; segments equal, twice as long as the perianth-tube. *Stamens* equilateral, inserted slightly below the middle of the tube ; anthers sagittate at the base ; style filiform ; style-branches bifid, truncate, shorter than the style.

Corms persistent, as many as 20 superposed ; the younger corms densely covered with fibrous tunics ; stem bearing 3-4 foliaceous sheaths ; developed leaves 1. linear, laxly twisted ; inflorescence a lax panicle of cymes ; flower-spathes herbaceous in the lower half, chartaceous round the margin.

Endemic ; species 1, known only from the Palmiet River Mouth (Caledon district).

1314

30. LAPEYROUSIA, Pourr.

Perianth-tube sub-cylindric, slightly dilated towards the throat, longer than the limb ; segments sub-equal, spreading. *Stamens* inserted in the throat of the perianth-tube, unilateral ; filaments short, arcuate ; anthers sagittate at the base, basifixed. *Ovary* with numerous ovules ; style filiform ; style branches bifid, shorter than the style. *Fruit* oblong or globose, membranous, with loculicidal dehiscence. *Seeds* globose, or angled by pressure.

Corm flattened at the base, with matted tunics ; produced leaves 1-2, basal, distichous ; inflorescence various ; spathe-valves mostly herbaceous.

Species over 50, all African ; 36 species in South Africa, extending from S.W. Africa to Natal and the Transvaal and also in the central region.

1315

31. WATSONIA, Mill.

Perianth-tube curved, cylindric below, funnel-shaped above ; segments sub-equal, spreading, shorter than the tube. *Stamens* inserted below the throat of the perianth-tube, unilateral ; anthers versatile. *Ovary* globose, with many ovules ; style filiform ; style-branches subulate, bifid, shorter than the style. *Fruit* oblong, loculicidally dehiscent. *Seeds* globose, or angled by pressure.

Corm tunicated ; leaves usually rigid in texture, generally ensiform ; inflorescence a simple or branched spike ; spathe-valves entire, rigid, brown or herbaceous.

Species 24, one of which occurs in Madagascar ; the remainder found in South Africa from Clanwilliam to Natal and the Transvaal.

1316

32. FREESIA, Klatt

Perianth-tube long, funnel-shaped; segments sub-equal, shorter than the tube. *Stamens* inserted below the throat of the perianth-tube, unilateral; anthers sagittate. *Ovary* with numerous ovules; style filiform; style-branches bifid. *Fruit* loculicidally 3-valved. *Seeds* turgid.

Corm with thick reticulated tunics; leaves in a distichous fan-like rosette; inflorescence a lax secund spike; rhachis flexuose; spathe-valves small, green, membranous above.

Endemic; species 2, found from Caledon to Albany; also recorded from Hopetown, and Fauresmith in the O.F.S.

31. MUSACEÆ.

Flowers zygomorphic, bisexual, or unisexual by the abortion of the stamens or pistil. *Perianth* petaloid, similar or in two different series, free or more or less coherent. *Stamens* 5 (rarely 6), free, all fertile. *Ovary* inferior, 3-chambered; ovules usually numerous, sometimes solitary and basal; style simple; stigma more or less lobed or capitate. *Fruit* a berry, or a loculicidal or septicidal capsule. *Seeds* hard, often with an aril; embryo straight, with a disc- or cup-shaped sucker.

Generally perennial herbs, often of great size, rarely trees; leaves large, 2-rowed or spirally arranged, with a broad sheath, a strong stalk and a broad pinnately-veined blade; inflorescence simple or compound, the flower-groups subtended by large spathe-like often brilliantly coloured bracts; flowers large, often brightly coloured.

Genera 6; species 80, natives of Madagascar, Brazil, the Malay Archipelago, and South Africa. One genus widely cultivated.

Stemless plants; petals 3, blue or white; seed covered with a woolly aril 2. *Strelitzia*, Ait.

Tall plants; petal 1; seeds not woolly 1. *Musa*, Linn.

1318

1. MUSA, Linn.

Flowers unisexual. *Calyx* tubular, 3-5-lobed, slit down one side. *Petal* one, entire or 3-lobed, placed opposite the slit side of the calyx. *Stamens* 6, 5 perfect, 1 rudimentary; filaments filiform; anthers linear, 2-theous. *Ovary* with many ovules in each chamber; style filiform; stigma terminal, 6-toothed or with a small filiform appendage. *Fruit* fleshy, indehiscent. *Seeds* globose, or angled by pressure, often excavated at the hilum; endosperm present; embryo straight.

Stem cylindric or bottle-shaped, woody; leaves large; flowers in terminal spicate panicles, few to many to a bract; those of the lower bracts fertile, those of the upper bracts staminate; bracts large and spathaceous.

Species about 20, confined to the tropical regions of the Old World; 1 species found near Haenertsburg in the northern Transvaal.

1319

2. STRELITZIA, Ait.

Flowers bisexual. *Sepals* 3, yellow or white; the lower sepal more concave than the others. *Petals* 3, free, blue or white; the two lower petals connivent and forming a sagittate blade with a central channel in which the stamens and style are placed; the third petal much smaller. *Stamens* 5, all perfect; anthers 2-theous, long-linear. *Ovary* with many superposed ovules in each chamber; style with 3 linear branches. *Capsule* oblong, 3-angled, loculicidal. *Seeds* few, with a woolly aril.

Stemless plants or with a stem; leaves distichous, more or less oblong; petiole up to 6 ft. long, deeply channelled down the face; peduncle erect; flowers several in the axis of a coriaceous bract.

Endemic; species 4, extending from Natal and the Transvaal to Humansdorp and the neighbourhood of Knysna.

32. ZINGIBERACEÆ.

Flowers bisexual, occasionally some flowers unisexual, zygomorphic. *Perianth* of two whorls of 3, generally distinguishable into calyx and corolla. *Upper stamen* of the inner whorl alone fertile, often with a broad connective; lateral stamens of the inner whorl united to form a conspicuous petaloid labellum; the 2 lateral stamens of the outer whorl sometimes present as staminodes. *Ovary* inferior, 3-chambered, with axile placentation, sometimes one-chambered with parietal placentation; style lying in a channel of the fertile stamen. *Seeds* numerous, generally arillate; perisperm large, mealy; embryo straight, cylindric.

Perennial herbs, with elongated or tuber-like rhizomes and often thickened roots; leaves simple, consisting of a sheath, stalk, and blade, with a ligular outgrowth of the sheath; inflorescence simple or compound.

Genera 24; species about 300. Found in the tropics of both hemispheres, but chiefly Asiatic.

1346

1. KÆMPFERIA, Linn.

(*Siphonochilus*, Wood and Franks).

Flowers bisexual, rarely with occasional unisexual flowers. *Calyx* tubular, or often spathaceous and split down one side, membranous. *Corolla-tube* shorter or longer than the calyx, sometimes in the female flowers very long and narrow; lobes lanceolate or linear. *Filament* of fertile stamen broad, flat, short; anther 2-thealous, linear, with the connective produced above into a petaloid entire lobed or toothed appendage; lateral staminodes conspicuous, usually longer than the corolla-lobes, free, or (in the South African species) united to the lip; lip more or less 2-lobed, rarely entire, usually much larger than the lateral staminodes. *Ovary* 3-chambered, with many ovules in each chamber; style filiform; stigma funnel-shaped. *Nectary* consisting of 2 narrowly cylindric or filiform glands.

Herbs; rhizome subterranean, thick, often aromatic; stem usually very short; leaves oblong to lanceolate, usually with long sheaths; inflorescence a spike, or sub-capitate, or flowers solitary; flowers usually large, pedunculate or sub-sessile, sometimes with the ovary subterranean; bracts lanceolate or oblong, membranous to almost coriaceous.

Species 55, natives of Africa and tropical Asia; 3 species in South Africa, only known from Natal and the Transvaal.

33. BURMANNIACEÆ.

Flowers bisexual. *Perianth* petaloid, 6-lobed; tube cylindric or gibbous, sometimes winged; lobes in 2 series, with the outer series larger, or lobes 3 in one whorl. *Stamens* 3-6, inserted on the perianth; anthers with 2 widely separated thecae; connective dilated. *Ovary* inferior, 1-chambered, with 3 parietal placentas, or 3-chambered with 3 axile placentas; style simple; stigmas 3, often 2-3-fid; ovules numerous. *Capsule* crowned by the marcescent perianth, terete, or 3-angled, or 3-winged, opening by apical valves, longitudinal slits, or a lid. *Seeds* numerous, small.

Small terrestrial herbs with green leaves, or slender leafless parasites ; inflorescence a many-flowered bracteate cyme, more rarely flowers solitary.

Genera 9 ; species about 50, dispersed through the tropics of both hemispheres.

1382

1. BURMANNIA, Linn.

Perianth 6-lobed ; tube prominently 3-angled or 3-winged ; the inner perianth-lobes smaller than the outer or sometimes absent. *Anthers* 3, sub-sessile on the perianth-tube ; connective produced at the apex into an entire or 2-partite erect. *Ovary* 3-chambered, with numerous ovules ; style shortly 3-lobed. *Capsule* more or less strongly 3-winged.

Erect unbranched herbs, with minute leaves or scales, sometimes with larger basal leaves ; flowers blue or white, rarely yellow, solitary and terminal, or many and in cymes.

Species about 20, in the tropics of both hemispheres ; 1 species has been doubtfully recorded from South Africa.

34. ORCHIDACEÆ.

Flowers bisexual, zygomorphic. *Perianth* in 2 whorls ; outer whorl (*sepals*) of 3 segments, mostly coloured and petaloid, sometimes green ; odd sepal either in front (*anticous*) or generally the ovary twisted and then the odd sepal behind (*posticous*), often hood-shaped (*galeate*) ; inner whorl (*petals*) of 3 segments ; 2 lateral segments often smaller than the odd segment which forms a lip or labellum ; lip when antieous often lobed, sometimes spurred, when postieous sometimes galeate. *Stamen* 1 ; anther 2-theecous, with the pollen usually cohering in 2, rarely 4 or 8, masses (*pollinia*) ; each pollinium attached to a viscid gland, rarely both pollinia attached to a common gland. *Ovary* inferior, 1-chambered, with many ovules on 3 parietal placentas ; upper continuation of ovary combined with some parts of the modified stamen to form a column, which usually bears the stigma in front ; stigma simple or bilobed, with the third branch transformed into a special organ (the *rostellum*) which usually bears the glands on its lateral projections (arms of the rostellum) ; glands produced by the rostellum and joined to elongations of the pollinia called *caudicles*. *Fruit* a capsule, 3-ribbed, 3-valved ; seeds extremely small.

Perennial herbs, occasionally shrubby, terrestrial or epiphytal ; leaves either all radical or also cauline, alternate, simple, entire ; inflorescence terminal, basal, or axillary, a spike, raceme, corymb, or panicle, sometimes flowers solitary.

Genera between 300-400 ; species over 5,000. Found throughout the globe, except in the highest latitudes and altitudes and the more remote oceanic islands, rare in very dry countries. The epiphytic species mostly confined to the intertropical zone within which they are most numerous in the mountains of tropical Asia and America.

Tribe **Ophrydeæ** : Pollinia granular or sectile, with a distinct caudicle and gland, sometimes with 2 distinct caudicles and glands ; anther-thecae adnate to the column and persistent, often continuous with the rostellum (genera 1-32).

Tribe **Neottieæ** : Pollinia granular or powdery, free or with apical caudicle and gland ; anther-case operculate or erect and persistent (genera 33-36).

Tribe **Epidendrææ** : Anther 2-theecous ; pollinia 2-8, waxy, united by a viscid appendage, free from the rostellum (genera 37, 41, 44).

Tribe **Vandææ** : Anther-thecae usually confluent ; pollinia 2 or 4, attached singly or in pairs to a stipes and gland (genera 38-40, 42-43, 45-47).

61. Leaves usually in a basal or terminal rosette, rarely with leafy stems but then flowers reddish or yellow ... 24. *Aloe* Linn.
 Stems leafy; leaves short, thick, multifarious or quinquefarius; flowers usually whitish ... 27. *Apicra* Willd.

963 1. *GLORIOSA* Linn., Sp. Pl., ed. 1, p. 305 (1753)

Perianth-tube 0; segments equal, clawed, spreading or reflexed, persistent. *Stamens* hypogynous; filaments filiform; anthers linear-oblong, versatile, dehiscent extrorsely near the margin. *Ovary* sessile, oblong in outline, with many ovules in each chamber; style filiform, trifurcate at the apex. *Fruit* coriaceous, septicidally 3-valved. *Seed* globose, bright red; endosperm firm.

Rootstock tuberous; stems slender, usually elongated and scandent; leaves sessile, with the apex terminating in a tendril; inflorescence corymbose; flowers few, large, showy.

Species 4—5, found in Africa and tropical Asia; 2 species (perhaps only forms of a single species) recorded from South Africa, extending from the Transvaal and Natal to the Bathurst district. (Type: *G. superba* Linn.)

964 2. *LITTONIA* Hook. f., Bot. Mag., t. 4723 (1853)

Perianth-tube very short; segments equal, ascending. *Stamens* much shorter than the perianth; filaments filiform; anthers linear-oblong, versatile, dehiscent extrorsely. *Ovary* sessile, oblong in outline, deeply 3-grooved, with many ovules in each chamber; style short, cylindric, with 3 falcate branches. *Fruit* coriaceous, septicidally 3-valved.

Rootstock tuberous; stems simple or branched, leafy to the apex; leaves produced into a tendril at the apex; flowers solitary from the axils of the upper leaves.

An African genus of 7 species of which 1 occurs in South Africa and extends from the northern Transvaal and Natal to the East London district and is also found in the eastern part of the Orange Free State. (Type: *L. modesta* Hook. f.)

965 3. *SANDERSONIA* Hook. f., Bot. Mag., t. 4716 (1853)

Perianth-tube globose, constricted at the mouth, saccate at the base; segments short, broadly ovate, shorter than the tube. *Stamens* much shorter than the perianth-tube; filaments filiform; anthers oblong, versatile, dehiscent extrorsely. *Ovary* oblong in outline, deeply 3-lobed, with many ovules in each chamber; style short, cylindric, trifid at the apex.

Rootstock tuberous; stem leafy to the apex; leaves sessile, alternate, linear or lanceolate; flowers solitary in the axils of the upper leaves; pedicels cernuous, without bracts.

Endemic; species 1, extending from Zululand into Pondoland. (Type: *S. aurantiaca* Hook. f.)

969 4. *ANDROCYMBIUM* Willd., in Mag. Ges. Naturf. Fr. Berlin, vol. 2, p. 21, t. 2 (1808)

Perianth-tube 0; segments subequal, with a distinct canaliculate claw and an acute lamina with incurved edges. *Stamens* inserted at the junction of the claw and lamina; filaments filiform, thickened towards the base; anthers oblong, versatile, dehiscent laterally. *Ovary* sessile, with many ovules in each chamber; styles 3, distinct; stigmas minute. *Fruit* a septicidal capsule. *Seed* globose; endosperm firm.

Underground stems an ovoid corm with membranous tunics; stem simple, short or 0; leaves crowded in the acaulescent species; inflorescence a globose head, over-topped by the exterior bracts.

Species about 35, mostly South African; 1 species in tropical Africa; 1 species found in Palestine; the South African species found chiefly in South West Africa and Namaqualand to Clanwilliam and the north-western districts; some species also found in the central districts and extend to the Albany, Humansdorp, and Knysna districts; species less frequent in the south-western districts, Natal, and the Transvaal.

970 **5. BAEOMETRA** Salisb., Trans. Hort. Soc., vol. 1, p. 330 (1812)

Perianth-tube 0; segments subequal, with a long convolute claw. *Stamens* inserted at the junction of the perianth-claw and blade; filaments subulate, tapering upwards; anthers versatile, dehiscent along the margin. *Ovary* sessile, cylindric, 3-angled, with many ovules in each chamber; styles 3, short, spreading. *Fruit* 3-angled, much longer than broad, septicidally 3-valved. *Seed* brown, globose or angled by pressure; endosperm cartilaginous.

Underground stem a corm; stem simple; leaves several; lower leaves lanceolate, clasping the stem, gradually reduced upwards; inflorescence a raceme or flowers solitary.

Endemic; species 1, extending from the Clanwilliam to the Riversdale districts. (Type: *B. columellaris* Salisb.)

971 **6. DIPIDAX** Laws., Cat. 8 ex Salisb. in Trans. Hort. Soc., vol. 1, p. 330 (1812)

Perianth deciduous; tube 0; segments subequal, clawed, with a pair of nectariferous spots at the base of the blade. *Stamens* inserted on the claw of the perianth-segments; filaments subulate; anthers oblong, versatile, dehiscent extrorsely along the margin. *Ovary* sessile, 3-lobed, with many ovules in each chamber; styles 3, subulate, falcate. *Fruit* turbinate, septicidally 3-valved. *Seed* brown, subglobose; endosperm firm.

Underground stems a tunicated corm; leaves generally 3, persistent; inflorescence a few- or many-flowered spike.

Endemic; species 2, extending from the Clanwilliam to the Humansdorp and Port Elizabeth districts. (Type: *D. triquetra* (L. fil.) Bkr. = *D. rosea* Salisb.)

971a **7. NEODREGIA** C. H. Wright, Kew Bull., p. 308 (1909)

Perianth-tube 0; segments shortly clawed, with auricles just above the claw. *Filaments* filiform; anthers small, dorsifixed. *Ovary* deeply 3-lobed, with the carpels diverging at the apex, with about 6 ovules in each ovary-chamber. *Fruit* a loculicidal capsule. *Seed* lenticular.

Underground stem a tunicated bulb; leaves cauline, alternate, sessile; inflorescence a lax terminal spike.

Endemic; species 1, extending from the Albany to the Port Elizabeth and Knysna districts. (Type: *N. glassii* C.H.W.)

972 **8. WURMBEA** Thunb., Nov. Gen. Pl., p. 18, t. 1 (1781)

Perianth persistent; tube campanulate or cylindric; segments equal, spreading, with 2 glandular foveoles above the base. *Stamens* inserted at the base of the perianth-segments; filaments filiform; anthers oblong, versatile, dehiscent extrorsely near the margin. *Ovary* sessile, 3-lobed at the apex, with many ovules in each chamber; styles free, subulate. *Fruit* globose, septicidally 3-valved. *Seed* brown, subglobose; endosperm firm.

Underground stems a tunicated corm; stem simple, with a few narrow leaves; inflorescence a spike; bracts 0.

44. Lip much fimbriated 5. *Huttonæa*, *Harv.*
 Lip entire or 3-5-lobed 45
 45. Odd sepal inferior 46
 Odd sepal superior 48
 46. Rostellum produced on each side of the column into adnate
 ciliate wings 11. *Porficaria*, *Lindl.*
 Rostellum produced into horn-like appendages, or with short side
 arms, not ciliated 47
 47. Rostellum fleshy, pyramidal or horseshoe-shaped, with two horn-
 like appendages 10. *Pachites*, *Lindl.*
 Rostellum erect, emarginate, obovate, bifid or trifid, with short side
 arms 20. *Orthopenthea*, *Rolfe*
 48. Lip 3-5-lobed or 3-toothed 49
 Lip entire 50
 49. Leaves cauline, decreasing upwards into the bracts
 12. *Brachycorythis*, *Lindl.*
 Leaves radical 1. *Stenoglottis*, *Lindl.*
 50. Column produced upwards into a pair of broad diverging arms
 30. *Ceratandropsis*, *Rolfe*
 Rostellum 3-partite, with divaricate side lobes 22. *Penthea*, *Lindl.*

1407

1. STENOGLOTTIS, Lindl.

Sepals free, sub-equal. *Petals* somewhat narrower than the sepals. *Lip* continuous with the base of the column, 3-5-fid. *Column* very short and broad. *Anther-thecae* parallel; pollinia 2, granular, affixed by a short stipes to a small oblong gland. *Stigmatic processes* 2, clavate or capitate. *Capsule* oblong, erect.

Terrestrial herbs, with short stems and tuberiferous or thickened fleshy fasciculate roots; leaves radical, numerous, rosulate or tufted; inflorescence a loose or sometimes dense somewhat one-sided raceme; bracts small.

An African genus of 3 species; 2 species in South Africa, extending from the Albany district through the Transkei into Natal and Zululand and into the northern Transvaal; 1 species occurs in tropical Africa.

1408

2. HOLOTHRIX, L.C. Rich.

Sepals sub-equal, connivent, sometimes hairy. *Petals* longer than the sepals, entire or variously divided at the apex. *Lip* adnate to the base of the column, spurred at the base, divided at the apex into 3 to many segments. *Column* very short, usually auricled at the sides of the stigma. *Anther-thecae* ovoid, adnate, distinct; pollinia 2, with very short caudicles attached to a single naked gland. *Capsule* ovoid or oblong.

Terrestrial herbs, with 1 or 2 sessile ovate or orbicular-reniform radical leaves; flowers usually in secund spikes on a slender usually hairy scape.

An African genus of about 40 species; 24 species in South Africa, found in the Cape Peninsula, the Albany district, eastern O.F.S., Natal, and the northern Transvaal; also found in the Somerset East district; 2 species in Madagascar and 1 in the Comoro Islands.

1410

3. PLATANThERA, L.C. Rich.

Sepals unequal, free; lateral sepals more or less spreading or reflexed. *Petals* usually narrower than the dorsal sepal and adpressed to it forming a hood. *Lip* continuous with the column, sometimes shortly adnate to it, produced at the base into a short or much elongated spur, entire or 3-lobed; the side lobes sometimes fimbriate or pectinate. *Column* short. *Anther-thecae* parallel or diverging; pollinia 2, with short caudicles and

exserted naked glands. *Rostellum* 3-lobed, with the middle lobe subulate or tooth-like. *Capsule* elliptic or oblong.

Erect terrestrial herbs, with ovoid-globose or rarely somewhat lobed tubers; leaves radicle or cauline; inflorescence a dense or lax spike or raceme; bracts narrow or rarely somewhat leafy.

Species about 60, mostly in temperate and sub-tropical regions of the northern hemisphere; 2 species in South Africa, 1 extending from Riversdale to Albany, the other found in Natal, the northern Transvaal, and also in tropical Africa.

1410a

4. PERISTYLUS, Blume

Sepals free, sub-equal. *Petals* similar to the sepals. *Lip* continuous with the column, free or slightly adnate to it, spurred at the base, entire or 3-lobed. *Anther-thecae* parallel; pollinia 2, with short caudicles and on exserted naked glands. *Rostellum* subulate or tooth-like. *Capsule* ellipsoid or oblong.

Terrestrial herbs, with oblong or sub-globose tubers; leaves radical and cauline, decreasing upwards; inflorescence a narrow spike or raceme; bracts lanceolate.

Species about 50, the majority Indian and extending into the Malayan and Chinese regions, with 6 tropical African representatives; 1 species recorded from Natal.

1414

5. HUTTONÆA, Harv.

Dorsal sepal free, clawed, lanceolate or ovate, erect; lateral sepals larger and broader, oblique spreading. *Petals* clawed, with the claw united at the base to the claw of the dorsal sepal; limb broad or sub-orbicular, much fimbriated. *Lip* much fimbriated. *Column* short and broad. *Anther-thecae* adnate; pollinia 2, solitary in the thecae, with somewhat elongated caudicles attached to separate glands. *Rostellum* 3-lobed, with the side lobes complicate round the caudicles of the anther. *Capsule* oblong.

Terrestrial herbs, with a globose tuber; leaves few, decreasing upwards; inflorescence a short or lax raceme; bracts lanceolate.

Endemic; species 5, extending from Stockenstrom, through the Transkei, and East Griqualand into Natal; also found in the eastern O.F.S.

1416

6. BARTHOLINA, R.Br.

Sepals sub-equal, free, erect. *Petals* coloured, about as long as the sepals. *Lip* adnate to the column at the extreme base, spurred, deeply fimbriate-multifid. *Column* very short below the anther; stigma not produced. *Anther-thecae* sub-parallel, adnate; pollinia 2, solitary in the thecae; caudicles very long, attached to separate glands.

Dwarf terrestrial herbs, with ovoid-oblong tubers; leaves solitary, basal, reniform-orbicular and amplexicaul; flowers solitary at the apex of a short hairy scape.

Endemic; species 3, massed in the south-western districts; 1 species extends as far as Albany.

1421

7. CYNORCHIS, Thouars

Sepals sub-equal; dorsal sepal erect, concave; lateral sepals oblique and spreading. *Petals* entire, narrower than the dorsal sepal, and adpressed to its margin forming a hood. *Lip* inferior, continuous with the column, spurred at the base, 3-5-lobed. *Column* very short and broad. *Anther-thecae* diverging; pollinia 2, granular, extended into slender caudicles,

terminating in small exserted naked glands. *Stigma* bi-lobed, extended into a pair of oblong or clavate papillose processes; rostellum trilobed. *Capsule* erect, oblong or fusiform, sometimes shortly beaked.

Terrestrial herbs, with fasciculate fleshy roots, sometimes thickened into tubers; leaves radical, few or solitary; inflorescence a short or elongated raceme; bracts small or narrow.

Species about 40, the majority natives of the Mascarene Islands; a few in tropical Africa; 3 species occur in China and Japan; 1 species found in Natal.

1422

8. HABENARIA, Willd.

Sepals unequal, free. *Petals* simple or deeply bilobed, usually narrower than the dorsal sepal and adpressed to it forming a hood, or the upper lobe alone adpressed and the lower descending and simulating a lobe of the lip. *Lip* continuous with the column, often shortly adnate to it, produced at the base into a spur, entire or 3-lobed, with the side lobes somewhat fimbriate or pectinate. *Column* short. *Anther-thecae* parallel or diverging; pollinia 2, granular, with the caudicles fixed to exserted naked glands. *Stigma* bilobed or extended into two short or elongate often clavate papillose processes. *Rostellum* 3-lobed, with the middle lobe subulate or tooth-like. *Capsule* ellipsoid or oblong, sometimes beaked.

Terrestrial herbs, with ovoid-globose or rarely lobed tubers; inflorescence a lax or dense spike or raceme; bracts mostly narrow.

Species over 500, widely diffused through tropical and sub-tropical regions; 37 species in South Africa, extending from Swellendam to Zululand; also found in the northern Transvaal and eastern O.F.S.

1422a

9. BONATEA, Willd.

Sepals unequal, free; dorsal sepal erect; lateral sepals oblique, reflexed. *Petals* deeply bipartite. *Lip* continuous with the column, produced at the base into a spur, adnate at the base to the base of the lateral sepals the anterior lobe of the petals and the stigmatic processes, tripartite. *Column* short. *Anther-thecae* somewhat diverging; pollinia 2, granular, with elongated curved caudicles and exserted naked glands. *Stigma* bipartite, extended in front into a pair of elongate sub-clavate processes; rostellum trilobed. *Capsule* oblong.

Terrestrial herbs with the habit of a large *Habenaria*; inflorescence a more or less elongated raceme; bracts ovate.

An African genus of 18 species; 7 species in South Africa, extending from Uitenhage through the Transkei into Natal; also found in parts of the Transvaal; rare in the south-western districts of the Cape Province.

1426

10. PACHITES, Lindl.

Sepals sub-equal, free, spreading. *Petals* similar to the sepals or rather smaller. *Lip* superior, erect, undivided or 3-lobed, not spurred. *Column* erect. *Anther-thecae* pendulous, separate, or approximate at the base; pollinia 2, in separate thecae, with ascending caudicles each attached to a separate gland. *Rostellum* with 2 horn-like appendages. *Ovary* and *pedicel* not twisted.

Terrestrial glabrous herbs, resembling a slender *Disa* in habit, with somewhat thickened roots; leaves linear, cauline, erect; inflorescence a short or cylindric spike; bracts lanceolate.

Endemic; species 2, confined to south-western districts of the Cape Province.

1427

11. FORFICARIA, Lindl.

Sepals free ; odd sepal inferior, spathulate, concave, without a spur. *Petals* somewhat oblique, entire, lanceolate, recurved above the middle, lying on the odd sepal. *Lip* superior, reniform-orbicular, obscurely trilobed and ciliate at the apex. *Anther* sub-erect, 2-theous, with the thecae distinct and parallel ; pollinia solitary in each theca, attached by short caudicles to 2 distinct glands. *Ovary* straight. *Rostellum* produced on each side of the column into adnate ciliate wings.

An erect herb, with several narrow grass-like leaves and a few basal sheaths ; inflorescence a slender somewhat elongated raceme.

Endemic ; species 1, extending from Worcester to Knysna.

1428

12. BRACHYCORYTHIS, Lindl.

Sepals free, connivent, or the lateral ultimately spreading ; lateral sepals oblique, often broader than the dorsal, sometimes falcate and ascending. *Petals* usually oblique and similar to the dorsal sepal or narrower, incurved over the column. *Lip* continuous with the base of the column, concave or gibbous at the base, 3-toothed or 3-lobed. *Anther* erect ; thecae parallel ; pollinia 2, with short caudicles attached to separate approximate glands. *Stigma* fleshy or concave ; rostellum short, 3-lobed. *Capsule* narrowly oblong.

Terrestrial herbs with undivided or ovoid tubers ; leaves sessile, generally numerous and imbricate, gradually decreasing upwards into the bracts ; inflorescence a spike or raceme, usually dense and many-flowered ; bracts ovate or ovate-lanceolate, often somewhat leafy.

Species about 22, exclusively African ; 4 species in South Africa, extending from Stockenstrom, through the Transkei into Natal and Zululand, also found in the northern Transvaal, eastern O.F.S. ; 1 species extends into tropical Africa.

1430

13. SATYRIUM, Sw.

Sepals sub-equal, or the lateral broader, spreading or reflexed. *Petals* more or less united to the sepals at the base, similar to, or narrower than the odd or front sepal. *Lip* superior, sessile at the base of the column, erect, galeate or cucullate, more or less united at the base to the lateral sepals, produced behind into a pair of descending spurs or sacs, rarely without a sac. *Column* erect, divided at the apex into 2 lobes. *Anther* hanging under the rostellum or horizontal ; thecae nearly parallel ; pollinia 2, granular, each with a slender stipes and distinct gland. *Ovary* and *pedicel* not twisted.

Terrestrial herbs, with ovoid or globose tubers ; leaves few and basal, sometimes prostrate on the ground, or more numerous and cauline, decreasing upwards into the bracts ; inflorescence usually a dense or many-flowered spike ; bracts membranous, often reflexed after flowering.

Species about 100, mostly African ; a few representatives in the Mascarene Islands ; 2 or 3 in India and South China ; 52 species in South Africa, widely distributed from the south-western Cape Province to Natal ; also found in the northern Transvaal and eastern O.F.S.

1430a

14. SATYRIDIUM, Lindl.

Sepals free, sub-equal, spreading or reflexed. *Petals* free, rather narrower than the lateral sepals, reflexed. *Lip* superior, sessile at the base of the column, erect, cucullate or rostrate, produced behind into a pair of short oblong descending sacs. *Column* divided at the apex into 2 lobes. *Anther* hanging vertically and nearly free in front of the column ;

thecae parallel ; pollinia 2, granular, each with a slender stipes, united to a single orbicular gland. *Ovary* and *pedicel* not twisted.

An erect glabrous herb, with a few thickened roots ; leaves few and sub-basal, with a few sheaths on the lower part of the stem, reduced upwards into the bracts ; inflorescence a somewhat dense many-flowered spike ; bracts membranous, reflexed after flowering.

Endemic ; species 1, found only in the south-western districts of the Cape Province.

1430b

15. AVICEPS, Lindl.

Sepals and *petals* united almost to the apex into a broadly oblong spreading papillose limb. *Lip* superior, erect, cucullate, broadly ovate, acute, produced behind into a pair of sacs or spurs. *Column* erect, divided at the apex into 2 lobes. *Anther* hanging under the rostellum ; thecae parallel ; pollinia 2, granular, each with a short stipes and distinct gland. *Ovary* and *pedicel* not twisted.

A dwarf glabrous herb, with elliptic-ovoid tubers ; leaves in a basal tuft, spreading ; inflorescence a short sub-capitate spike and almost included within the tuft of leaves ; bracts leaf-like, spreading.

Endemic ; species 1, found only in the south-western districts of the Cape Province.

1431

16. SCHIZOCHILUS, Sond.

Sepals free, connivent or ultimately spreading, sub-equal. *Petals* oblique, smaller than the sepals. *Lip* united to the base of the column, spurred at the base, entire or trifid. *Column* short ; stigma near the base of the column. *Anther* erect or slightly reclinate ; pollinia 2, in separate thecae ; caudicles short ; glands distinct. *Capsule* ovoid or oblong, short, straight.

Terrestrial herbs, with ovoid-oblong tubers ; leaves radical or sub-radical ; the upper reduced to small sheaths ; inflorescence a dense spike ; bracts narrow, shorter than the flowers.

Species 11, all endemic except one which occurs in Rhodesia ; extend from Fort Beaufort to Natal, also found in the northern Transvaal and eastern O.F.S.

1432

17. SCHIZODIUM, Lindl.

Sepals free, more or less spreading ; odd sepal superior, with an oblong or narrow spur behind. *Petals* free, often narrow and unequally bilobed at the apex, more or less adnate to the rostellum at the base. *Lip* fiddle-shaped, often narrowed or acuminate in front, sometimes with a filiform appendage. *Anther* reflexed, with 2 parallel thecae ; pollinia 2, attached by short caudicles to separate glands. *Rostellum* erect, emarginate or retuse, with short side lobes. *Capsule* obovate-oblong, ribbed.

Terrestrial herbs, with simple thickened tubers ; leaves spatulate or elliptic-ovate, in a spreading radical tuft ; inflorescence a short or lax raceme ; bracts usually ovate-lanceolate.

Endemic ; species 8, mostly in the south-western districts of the Cape Province ; 1 species found in Van Rhynsdorp ; 1 species extends to Port Elizabeth.

1433

18. BROWNLEE, Harv.

Sepals free, more or less spreading ; odd sepal superior, hooded, spurred. *Petals* erect, more or less adhering to the inner sides of the mouth of the dorsal sepal and adnate to the column at the base. *Lip* usually narrow or minute, entire, sometimes dilated and clasping the base of the column. *Anther* horizontal or reflexed, with 2 parallel thecae ; pollinia 2, solitary in each

theca, attached by short caudicles to separate glands. *Rostellum* erect, more or less distinctly bilobed. *Capsule* cylindric or oblong, ribbed.

Terrestrial herbs, with simple sessile tubers; leaves cauline, few to several, usually more or less spreading; inflorescence a dense or lax spike or raceme, rarely flowers solitary.

Species about 13; 2 in tropical Africa; 1 in Madagascar; 10 in South Africa, extending from George to Natal; also found in the northern Transvaal and the eastern O.F.S.

1434

19. DISA, Berg.

Sepals free; odd sepal superior, concave, hood-shaped, or helmet-shaped, with a more or less elongated spur or sac. *Petals* usually much smaller than the sepals, generally more or less adnate to the column at the base. *Lip* anticus, usually small and narrow. *Anther* sub-erect, horizontal, reclinate, or reflexed, 2-theous, with the thecae distinct and parallel; pollinia solitary in each theca, attached by short or long caudicles to two distinct glands. *Ovary* twisted. *Rostellum* erect, sub-entire, bifid or trifid at the apex, sometimes with side processes, often more or less adnate to the base of the petals and sometimes forming a ridge upon them. *Capsule* cylindric, clavate, or narrowly ellipsoid.

Terrestrial herbs, with simple sessile tubers; leaves radical or cauline; inflorescence a corymb, raceme, or a lax or dense spike, rarely flowers solitary.

Species about 100, natives of Africa and Madagascar; 69 species in South Africa, extending from Natal along the coastal belt to Clanwilliam; also found in the northern Transvaal and eastern O.F.S.

1434a

20. ORTHOPENTHEA, Rolfe

Sepals free; odd sepal inferior, expanded and horizontal, or hooded and reflexed, concave, saccate, or with a short spur. *Petals* reflexed, more or less adnate to the column at the base. *Lip* superior, oblong, narrow, trowel-shaped or broadly elliptic, without a spur. *Column* short. *Anther* horizontal or reflexed, 2-theous, with the thecae distinct and parallel; pollinia 2, solitary in each theca, granular; attached by short caudicles to two distinct glands. *Ovary* straight rarely twisted. *Rostellum* erect, bifid or trifid. *Capsule* cylindric or oblong.

Terrestrial herbs, with simple sessile tubers; leaves cauline or radical; the upper often reduced and sheath-like; inflorescence usually a corymb or short spike, rarely the flowers sub-solitary; bracts usually narrow, rarely sheathing.

Endemic; species 10, mostly confined to the south-western districts of the Cape Province; 1 species extends to Knysna.

1434b

21. AMPHIGENA, Rolfe

Sepals free; odd sepal superior, galeate, with a conical obtuse spur. *Petals* erect, included within the galea, somewhat oblique, serrulate on the front margin. *Lip* anticus, small and narrow, entire, without a spur. *Column* short. *Anther* much reflexed; thecae distinct and parallel; pollinia 2, granular, attached by short caudicles to a single large nearly square gland. *Ovary* twisted. *Capsule* narrow.

Terrestrial herbs, with rather large irregular tubers, and narrow grass-like leaves springing from a basal sheath and appearing before the flowers and soon withering; inflorescence a narrow cylindric spike on slender wiry scapes; bracts small, narrow.

Endemic; species 2, confined to the south-western districts of the Cape Province.

1434c

22. PENTHEA, Lindl.

Sepals free ; odd sepal superior, spatulate, flat or concave, without a spur. *Petals* oblique, with a small basal auricle. *Lip* inferior, narrowly linear. *Anther* sub-erect, 2-theous, with the thecae distinct and parallel ; pollinia 2, solitary in each theca, attached by short caudicles to 2 distinct glands. *Ovary* twisted. *Rostellum* 3-partite.

Terrestrial herbs, with ovoid-oblong tubers ; leaves radical or cauline, reduced upwards into the bracts ; inflorescence a short corymb.

Endemic : species 2, confined to the south-western districts of the Cape Province.

1435

23. HERSCHELIA, Lindl.

Sepals free ; odd sepal superior, galeate, with a short broadly conical spur. *Petals* erect, included within the galea, unequally and deeply bilobed. *Lip* anticous, sessile or long-stalked, deeply fringed, crenate, or sub-entire, or dilated and variously lobed at the apex. *Column* short. *Anther* much reflexed ; thecae distinct and parallel ; pollinia 2, granular, attached by short caudicles to a large single gland (occasionally with 2 glands in *H. lugens*). *Ovary* twisted ; rostellum sometimes 3-toothed at the apex. *Capsule* narrowly oblong or clavate.

Terrestrial herbs, with large ovoid irregular tubers and narrow grass-like radical leaves ; inflorescence a short or somewhat elongated raceme on slender wiry scapes ; bracts usually narrow.

Species 14, all African ; 13 species in South Africa, found from Clanwilliam along the coastal belt to Tumbuland ; recorded also from the northern Transvaal.

1436

24. MONADENIA, Lindl.

Sepals free ; the odd sepal superior, hood-shaped, with an oblong or cylindric spur ; lateral sepals spreading. *Petals* erect, entire or bilobed. *Lip* anticous, usually small and narrow, without a spur. *Column* short. *Anther* erect or reclinate, 2-theous, with the thecae distinct and parallel ; pollinia 2, solitary in each theca, granular, attached by short or long caudicles to a single gland. *Ovary* twisted ; rostellum erect, sub-entire, emarginate, or 3-lobed. *Capsule* oblong or elliptic-oblong.

Terrestrial herbs with simple sessile tubers ; leaves usually cauline and gradually reduced upwards, or the lower sub-radical and the upper reduced to short sheaths ; inflorescence usually a dense cylindric spike, sometimes more lax or in short spikes ; bracts usually narrow or narrowed from a broader base.

Endemic ; species 19, mostly massed in the south-western districts of the Cape Province ; 1 species recorded from Little Namaqualand ; 1 species extends as far as Bathurst, and 1 species through the Transkei into Natal ; 1 species recorded from the northern Transvaal.

1437

25. DISPERIS, Sw.

Dorsal sepal erect, hooded or spurred ; lateral sepals oblique, dorsally saccate or spurred about the middle. *Petals* oblique, falcately curved, united to the margins of the dorsal sepal, sometimes auriculate on the free margin near the base. *Lip* ascending along the face of the column and adnate to it, narrowed into a claw below, dilated above into a variously shaped limb, bearing on its face a variously shaped appendage directed towards the apex of the dorsal sepal and sometimes incurved towards its mouth. *Column* erect, usually stout ; rostellum large, membranous, produced in front into 2 rigid cartilaginous diverging arms, holding at their

extremities the glands of the pollinia. *Anther-thecae* distinct ; pollinia with the granules usually large and secund in a double row on the margin of the flattened caudicles which curl up in a spiral on removal, attached to separate glands. *Capsule* cylindric or ovoid-oblong, ribbed.

Terrestrial herbs, with ovoid tubers ; leaves one to few, alternate or sometimes in a single opposite pair, or solitary ; flowers solitary, or inflorescence a raceme ; bracts sometimes large and leaf-like.

Species about 55, natives of Africa, India, New Guinea, and the Mascarene Islands ; 36 species in South Africa, extending from Clanwilliam to Stutterheim and into Natal ; also recorded from the northern Transvaal and eastern O.F.S.

1438

26. PTERYGODIUM, Sw.

Sepals free, spreading, ascending or reflexed ; odd sepal superior, more or less concave. *Petals* oblique and united to the margins of the dorsal sepal into a more or less flattened hood. *Lip* united to the face of the column, narrowed into a claw below, dilated into a reflexed undivided variously shaped limb above, produced above the junction with the column into a large variously shaped fleshy appendage. *Column* short, dilated, produced in front into two horizontal arms, holding at their extremities the glands of the pollinia. *Anther-thecae* more or less distant ; pollinia solitary in each theca, attached to separate glands by caudicles ; caudicles and glands uppermost. *Capsule* cylindric or obovate, with prominent ribs.

Terrestrial herbs, with small undivided sessile tubers ; leaves cauline ; inflorescence a dense or sometimes lax spike ; bracts lanceolate or ovate-lanceolate.

Endemic ; species 11, extending from Clanwilliam into the Transkei ; also recorded from the eastern O.F.S.

1438a

27. OMMATODIUM, Lindl.

Sepals free, spreading, ovate ; odd sepal superior, nearly flat. *Petals* obcordately bilobed, united with the dorsal sepal into a broad spreading hood which is strongly inflexed at the oblique apex. *Lip* adnate to the face of the column below, with a broadly triangular-hastate limb with a tooth-like fold on either side near the base and with an erect obovate and denticulate appendage. *Column* broadly dilated, produced in front into 2 oblong spreading arms. *Anther-thecae* distant ; pollinia solitary in each theca, attached to a short caudicle and a rounded gland. *Stigmas* 2, cushion-shaped, situated at the base of the appendage. *Capsule* oblong, ribbed.

A terrestrial herb, with small undivided sessile tubers ; leaves few, radical or sub-radical ; inflorescence a somewhat dense erect spike ; bracts ovate, spreading or reflexed.

Endemic ; species 1, extending from Little Namaqualand to Swellendam.

1438b

28. ANOCHILUS, Rolfe

Sepals free, spreading or reflexed ; odd sepal inferior, more or less concave. *Petals* oblique, more or less adnate to the dorsal sepal into a large concave limb. *Lip* superior, united to the face of the column, narrowed into a claw below, dilated into a broad incurved or reflexed limb above, produced above the junction with the column into a large deflexed somewhat bilobed appendage. *Column* short, dilated, produced in front into two short broadly rounded or oblong spreading arms carrying the glands of the pollinia. *Anther-thecae* more or less distant ; pollinia solitary in each theca, attached by caudicles to separate glands ; caudicles and glands uppermost. *Capsule* oblong, ribbed.

Terrestrial herbs, with small undivided tubers; leaves cauline; inflorescence a dense erect spike; bracts ovate or ovate-lanceolate.

Endemic; species 2, 1 extending from Little Namaqualand to Caledon, the other found in the Molteno district.

1439

29. CERATANDRA, Eckl.

Odd sepal inferior, deflexed, concave; lateral sepals approximate or connivent at the margin into a broad limb and erect behind the lip. *Petals* narrow, concave, united with the dorsal sepal into a concave deflexed limb. *Lip* superior, adnate to the column, broadly cordate or auriculate below, with an obovate-oblong truncate fleshy appendage about the middle. *Column* produced upwards into a pair of sub-erect oblong rostellary arms holding at their apex the glands of the pollinia. *Pollinia* coarsely granular, didymous, attached by long slender caudicles to broad glands. *Stigmas* 2, cushion-shaped, situated on the face of the column near the base. *Capsule* oblong, ribbed.

A stout terrestrial herb; leaves numerous, cauline; inflorescence a dense oblong spike or raceme; bracts linear.

Endemic; species 1, extending from Piquetberg to Knysna.

1439a

30. CERATANDROPSIS, Rolfe

Odd sepal superior; lateral sepals free, somewhat spreading. *Petals* somewhat oblique, united with the dorsal sepal into a concave spreading limb more or less auriculate at the base. *Lip* inferior, adnate to the column, with a broadly cordate-ovate limb, without an appendage. *Column* produced upwards into a pair of broad diverging arms. *Pollinia* 2, solitary in each anther-theca, attached by a slender stipes to a broad rounded gland. *Stigma* somewhat bilobed. *Capsule* oblong, ribbed.

Stout sub-erect herbs; leaves numerous, cauline, narrow; inflorescence a short oblong or sub-capitate spike; bracts linear.

Endemic; species 2, extending from Clanwilliam to Albany.

1439b

31. EVOTA, Rolfe

Sepals free, spreading; odd sepal superior, concave. *Petals* united with the dorsal sepal into a broad spreading limb. *Lip* inferior, adnate to the face of the column, with a half-moon-shaped or bilobed limb and with a large sub-quadrate or bilobed fleshy appendage. *Column* short; arms of the rostellum laterally dilated, not elongated. *Pollinia* solitary in each anther-theca, attached by a slender stipes to a single gland. *Stigma* cushion-shaped or bilobed, situated at the base of the column. *Capsule* oblong, ribbed.

Slender erect herbs, with fleshy roots; leaves radical and cauline; inflorescence a lax or somewhat dense raceme; bracts ovate.

Endemic; species 3, confined to the south-western districts of the Cape Province.

1440

32. CORYCIUM, Sw.

Sepals free or sometimes united; odd sepals erect, narrow, concave. *Petals* oblique, falcately curved and united to the margins of the dorsal sepal into a hood, usually somewhat contracted in front, concave or obliquely saccate at the base. *Lip* ascending along the face of the column and adnate to it, narrowed into a claw below, dilated into a reflexed transversely lunate or bilobed, more rarely oblong or lanceolate, limb above, produced at the junction with the column into a large reflexed or erect variously shaped

fleshy appendage. *Column* short, dilated, produced in front into 2 horizontal arms holding at their extremities the glands of the pollinia. *Anther-thecae* more or less distant ; pollinia attached by caudicles to separate glands ; glands uppermost. *Capsule* elliptic or oblong, usually much narrowed above, ribbed.

Terrestrial herbs, with undivided sometimes stalked tubers ; leaves radical and cauline, flat or sometimes crisped ; inflorescence an erect, often dense, spike ; bracts lanceolate.

Endemic ; species 14, extending from Clanwilliam to the south-western districts of the Cape Province ; also found in the Transkei, Natal, and the eastern O.F.S.

1464

33. POGONIA, Juss.

Sepals sub-equal, free, erect or rarely spreading. *Petals* similar to the sepals, or often broader or shorter. *Lip* erect from the base of the column, entire, or 3-lobed (in the South African species), with the side lobes enfolding the column ; disc variously erected or lamellate. *Column* elongated, slightly clavate at the apex. *Anther* somewhat stipitate, more or less incumbent, imperfectly 2-theous ; pollinia 2, sometimes confluent into 1, not tailed, free or sessile on the rostellum. *Stigma* oblong or broad.

Terrestrial herbs ; rhizomes tuberiferous ; leaves 1 to few, often not appearing until after the flowers ; inflorescence an erect or pendulous raceme, or flowers solitary.

Species about 80, widely dispersed through the tropics with a few temperate representatives in North and South America and in Japan ; 1 species occurs in the Transvaal.

1502

34. ZEUXINE, Lindl.

Sepals sub-equal ; dorsal sepal erect, concave ; lateral sepals spreading, free. *Petals* narrow, often cohering with the dorsal sepal to form a hood. *Lip* very shortly adnate to the base of the column, concave or sub-saccate at the base, with or without a pair of calli inside, more or less contracted in the middle, dilated at the apex into a small entire or larger 2-lobed spreading limb. *Column* very short. *Anther* erect or inclined in front, shortly apiculate ; pollinia granular, 2, affixed to a linear or cuneate stipes, with a broad rounded gland. *Stigmas* 2, lateral. *Capsule* small, erect, ovoid or sub-globose.

Slender or dwarf terrestrial herbs, with short creeping rhizomes ; leaves sessile, linear on a broad sheath, or petiolate with an ovate or lanceolate limb ; inflorescence a dense or slender spike ; bracts membranous, mostly shorter than the flowers.

Species about 30, mostly Indian and Malayan, with a few tropical African representatives ; 1 species occurs in Natal.

1516

35. PLATYLEPIS, A.Rich.

Sepals sub-equal, free, connivent round the column ; lateral sepals united at the base into a very short chin. *Petals* narrow, slightly cohering with the dorsal sepal into a hood. *Lip* sessile at the base of the column, broadly ventricose at the base, cohering with the margins of the column. *Column* elongated, sub-terete. *Anther* erect, acuminate, as long as the rostellum ; thecae distinct ; pollinia 2, attached to a minute gland by two stipes. *Stigma* broad, papillose ; rostellum erect, 2-lobed, with lanceolate acuminate lobes. *Capsule* oblong, shortly contracted at the apex.

Terrestrial herbs, with creeping rhizomes ; leaves petiolate, ovate or ovate-lanceolate ; inflorescence a dense spike ; bracts ovate.

Species 6, natives of Africa and the Mascarene Islands ; 1 species found in Natal.

1531a

36. CORYMBIS, Thouars

Sepals narrow and approximate below, somewhat spreading above. *Petals* similar to the sepals. *Lip* erect from the base, linear, channelled and dilated at the apex into a short recurved limb. *Column* elongated, terete, clavate at the apex, terminating in two erect lobes or auricles. *Anther* erect, acuminate, about as long as the column; pollinia granular, affixed to a subulate stipes, with a peltate gland, descending behind the rostellum. *Capsule* linear, sub-terete, crowned with the column and the remains of the persistent perianth.

Tall erect terrestrial herbs, with leafy sometimes branched stems, and numerous fibrous roots; leaves large, elliptic-lanceolate, acute, plicate-veined, enlarged at the base into an amplexicaul sheath; inflorescence an axillary or terminal panicle or raceme, sub-corymbose.

Species about 15, widely dispersed through the tropics; 1 species found in Pondoland, and extends into tropical Africa.

1556.

37. LIPARIS, L.C.Rich.

Sepals spreading, free, or the lateral more or less connate and often falcate and broader than the dorsal. *Petals* usually very narrow. *Lip* inferior, adnate to the base of the column, usually deflexed or recurved above the erect base, entire, often bi-tuberculate at the base. *Column* usually long and slender, incurved; usually marginate or winged at the apex. *Anther* terminal; pollinia 4, free or cohering by a viscid appendage.

Terrestrial or rarely epiphytic herbs, with or without pseudobulbs; leaves 1 or more, membranous and continuous with the sheath, or somewhat coriaceous and jointed to the sheath or pseudobulb; inflorescence a lax or dense raceme; flowers small or medium-sized; bracts small or narrow.

Species about 120, found throughout the warm and temperate regions of the globe, but most numerous in tropical Asia; 3 species in South Africa, found in the south-western districts of the Cape Province, the eastern districts, and Natal; 1 species extends into tropical Africa.

1561

38. ACROLOPHIA Pütz.

Sepals sub-equal, free, sub-connivent or spreading; the lateral not adnate to the foot of the column. *Petals* like the sepals or a little broader, similar in colour or sometimes paler. *Lip* continuous with the base of the column, 3-lobed or sometimes entire above, generally saccate or spurred at the base, very rarely without a spur; disc variously papillose or crested. *Column* short, clavate, not produced into a foot at the base. *Anther* terminal, operculate, semi-globose, conical or 2-horned above, imperfectly 2-theccous; pollinia 4, united in pairs, affixed to a broad stipes and gland. *Capsule* ovoid or oblong, with prominent thickened angles.

Terrestrial herbs; stems leafy at the base, not thickened into rhizomes; leaves in a more or less dichotomous basal tuft, coriaceous and persistent, plicate; inflorescence usually a panicle, more rarely a raceme; scape terminal; bracts small or narrow.

Endemic; species 9, mostly confined to the south-western districts of the Cape Province, but extend into the Transkei.

1565

39. POLYSTACHYA, Hook.

Sepals connivent or somewhat spreading; dorsal sepal free; lateral sepals adnate to the foot of the column. *Petals* usually narrower than the dorsal sepal. *Lip* superior, articulated to the foot of the column, 3-lobed or entire from a cuneate base. *Column* usually short, very broad, not winged,

produced into a long foot at the base. *Anther* terminal, very convex, 1-theous or imperfectly 2-theous; pollinia 4, waxy, broadly ovate, sometimes united in pairs, affixed to a short stipes and gland. *Capsule* oblong or fusiform, sometimes elongate.

Epiphytic herbs; stems often short, sometimes thickened into pseudobulbs, mostly leafy; leaves distichous, contracted into sheaths at the base; inflorescence terminal, a panicle or raceme, with a few sheaths below; bracts small.

Species over 100, widely diffused through the tropics, though the great majority are African; 10 species occur in South Africa, from Knysna, Komgha, and Pondoland into Natal; 1 species also recorded from the northern Transvaal.

1568

40. ANSELLIA, Lindl.

Sepals sub-equal, free, spreading. *Petals* similar to the sepals. *Lip* articulated to the foot of the column, 3-lobed; disc with 2-3 parallel keels. *Column* erect, semi-terete, with acute margins; base produced into a very short broad concave or slightly 2-lobed foot. *Anther* terminal, convex or crowned with an obtuse conical appendage, imperfectly 2-theous; pollinia 2 or 4, confluent in pairs, waxy, ovate, attached to a short broad stipes and gland. *Capsule* oblong, without a beak.

Epiphytic herbs; stems tall, thickened or somewhat fusiform, leafy; leaves distichous, plicate-veined; inflorescence a terminal panicle, more or less branched; flowers pedicellate, yellow, more or less blotched with brown; bracts small.

An African genus of 6 species; 1 species in Natal and the northern Transvaal.

1631

41. CALANTHE, R.Br.

Sepals sub-equal, free, usually widely spreading. *Petals* similar to the sepals or narrower. *Lip* usually more or less adnate to the column; limb spreading, 3-lobed, with the front lobe 2-lobed; disc variously crested or lamellate; base mostly extended into a slender spur. *Column* short, without a foot; wings usually united to the sides of the column. *Anther* sub-terminal, operculate, incumbent, 2-theous; pollinia 8, oblong or obovate, somewhat compressed; caudicles often somewhat attenuate and united by a viscid appendage. *Capsule* elliptic-oblong.

Terrestrial herbs, with short leafy stems, sometimes thickened at the base; leaves 2 to several, petiolate; limb elliptic- to oblong-lanceolate, acute or acuminate, plicate; inflorescence a loose or dense raceme, usually showy; scapes erect from the rhizome, often tall, with a number of sheaths towards the base; bracts lanceolate or ovate-lanceolate.

Species about 100, most numerous in tropical Asia, extending to Japan and Australia and sparingly represented in Africa, the West Indies and central America; 1 species found in the Perib Forest, Natal, and Zululand.

1647

42. LISSOCHILUS, R.Br.

Sepals sub-equal, free, spreading or reflexed; the lateral sepals sometimes adnate to the foot of the column. *Petals* erect, generally much larger and broader than the sepals and differently coloured. *Lip* continuous with the foot of the column, more or less distinctly 3-lobed; base variously saccate or spurred; disc variously cristate, lamellate or sometimes smooth. *Column* erect, clavate, more or less produced into a foot at the base. *Anther* terminal, semi-globose, conical or more or less bilobed at the apex, imperfectly 2-theous; pollinia 4, united in pairs and affixed to a broad stipes and gland. *Capsule* oblong or somewhat elongate, with prominent thickened angles.

Terrestrial herbs ; stems creeping, often thickened into rhizomes or tubers, leafy at the base ; leaves plicate ; inflorescence a loose raceme ; bracts small or narrow.

Species about 100, mostly African ; 2 or 3 species in the Mascarene Islands ; 13 species in South Africa, extending from Uitenhage to Natal and into the northern Transvaal.

1648

43. EULOPHIA, R.Br.

Sepals sub-equal, free, sub-connivent or spreading ; the lateral sepals sometimes adnate to the foot of the column. *Petals* like the sepals or a little broader, sometimes differently coloured. *Lip* continuous with the base or foot of the column, 3-lobed or entire, base usually variously saccate or spurred ; disc variously cristate or lamellate, rarely smooth. *Column* sometimes produced into a more or less distinct foot at the base. *Anther* terminal, semi-globose, conical, or rarely acuminate, more or less bilobed at the apex, imperfectly 2-theous ; pollinia 4, ovoid, united in pairs, affixed to a broad stipes and gland. *Capsule* ovoid or oblong, rarely elongated, with prominent thickened angles.

Terrestrial herbs or rarely epiphytes ; stems leafy at the base, creeping, often thickened into rhizomes, sometimes forming aerial pseudobulbs ; leaves distichous, usually plicate ; inflorescence a raceme, rarely a panicle ; scape lateral ; bracts small or narrow.

Species over 200, chiefly in the tropical and sub-tropical regions of the Old World, with the headquarters in Africa ; about 70 species in South Africa, extending from Uitenhage into Natal and the northern Transvaal ; rare in the south-western districts of the Cape Province.

1707

44. MEGACLINIUM, Lindl.

Sepals free ; dorsal sepal erect or spreading, longer than the lateral sepals ; lateral sepals falcate or reflexed about the middle, at the base adnate to the foot of the column. *Petals* smaller and narrower than the dorsal sepal, often very narrow. *Lip* articulated to the foot of the column, mobile, inflexed at the base, recurved above, entire or denticulate at the base, rarely somewhat 3-lobed. *Column* short, broadly dilated and winged at both sides, terminating above in acute or rounded teeth, base produced into a short foot. *Anther* terminal, operculate, incumbent, 2- or rarely 1-theous ; pollinia waxy, normally 4, but usually connate in pairs, without appendages.

Epiphytic herbs, with stout creeping rhizomes ; pseudobulbs sessile in the axil of a sheath, mostly 3-5-angled, 2- or 1-leaved ; scapes arising from the base of the pseudobulbs, simple ; apex dilated into a flattened often ensiform and almost foliaceous rachis, along either side of which the flowers and bracts are distichously arranged ; bracts usually ovate or triangular, ultimately much deflexed ; flowers small, pedicelled, curved.

Species about 30, mostly tropical African ; a single species in Madagascar ; 2 species in South Africa, extending from Pondoland to Natal and then into the northern Transvaal.

1828

45. ANGRÆCUM, Bory.

Sepals sub-equal, spreading or connivent. *Petals* similar to the sepals. *Lip* affixed to the base of the column and continuous with it, produced at the base into an elongated or saccate spur, entire or 3-lobed. *Column* very short, broad, concave in front, without wings or foot. *Anther* terminal, operculate, convex, often produced in front, scarcely 2-theous ; pollinia 2 ; stipes single, clavate or slender ; gland squamiform, simple. *Capsule* oblong or fusiform.

Epiphytic herbs ; stems leafy or rarely leafless, not thickened into pseudobulbs ; leaves distichous, coriaceous or fleshy, articulated to a persistent sheath, often more or less obliquely 2-lobed at the apex ; inflorescence lateral, a raceme, sometimes flowers solitary.

About 100 species, widely diffused in continental Africa and the Mascarene Islands, with an outlying species in China and Japan and another in the Philippines ; 11 species in South Africa, extending from Swellendam to Komgha and into Natal and Zululand ; also recorded from the northern Transvaal.

1835

46. LISTROSTACHYS, Reichb. f.

Sepals sub-equal, free, spreading or sub-connivent. *Petals* similar to the sepals. *Lip* affixed to the base of the column and continuous with it, produced at the base into a cylindric spur, entire or obscurely 3-lobed. *Column* very short, concave in front. *Anther* terminal, convex, often produced in front, scarcely 2-theous ; pollinia 2, globose, situated upon a pair of usually slender stipes, distinct or only united at the base, attached to a variously shaped gland. *Capsule* oblong or fusiform.

Epiphytic herbs ; stems leafy, not thickened into pseudobulbs ; leaves distichous, articulated to a persistent sheath ; inflorescence lateral, a raceme or head.

Species about 70, exclusively African or Mascarene, the majority being tropical African ; 1 species in South Africa, extending from Knysna to Natal and into the northern Transvaal.

1837

47. MYSTACIDIUM, Lindl.

Sepals sub-equal, free, spreading or connivent. *Petals* similar to the sepals. *Lip* affixed to the base of the column and continuous with it, produced at the base into a short or long spur, generally entire. *Column* very short, broad, concave in front. *Anther* terminal, operculate, convex, often produced in front, scarcely 2-theous ; pollinia 2, globose, situated on a slender pair of stipes which are attached to separate oblong or squamiform glands. *Capsule* oblong or fusiform.

Epiphytic herbs : stems leafy, not thickened into pseudobulbs ; leaves distichous, articulated to a persistent sheath ; inflorescence lateral, a raceme, or flowers solitary.

Species about 50, African or Mascarene, with a single outlying representative in Ceylon ; 9 species in South Africa, extending from Knysna and Komgha through the Transkei into Natal (in forests).

35. PIPERACEÆ.

Flowers bisexual or unisexual. *Perianth* none. *Stamens* 2-6, rarely more, hypogynous ; filaments usually free ; anthers often articulated on the filaments, with 2 distinct or confluent thecae. *Ovary* sessile, 1-chambered, with a single orthotropous ovule (in the South African genera) ; stigmas 1-5. *Fruit* (in the South African genera) indehiscent, baccate. *Seed* globose, ovoid, or oblong ; testa usually membranous or rather fleshy ; endosperm small ; perisperm copious, starchy ; embryo minute.

Herbs or shrubs, erect or climbing ; leaves usually alternate and entire, rarely opposite or verticillate ; stipules 0, or adnate to the petiole ; inflorescence usually a dense spike ; flowers minute, each subtended by a peltate bract.

Genera about 8, with about 1000 species spread through the warmer regions of both hemispheres.

Both the South African genera belong to the Tribe **Pipereæ**.

Shrubs; stamens 2-6; anther-thecae usually distinct; stigmas 2-4

1. *Piper*, Linn.

Herbs; stamens 2; anther-thecae usually confluent; stigma 1

2. *Peperomia*, Ruiz. & Pav.

1862

1. PIPER, Linn.

Flowers bisexual or unisexual. *Perianth* 0. *Stamens* 2-4, rarely more; filaments short; anther-thecae usually distinct. *Ovary* sessile, obtuse or rostrate; stigmas 2-4, distinct, erect or recurved. *Fruit* a berry, usually globose, often immersed in the succulent rhachis, more rarely stalked.

Erect or scandent herbs; branches jointed at the nodes; leaves alternate, entire, equal or unequal at the base, pinni-nerved; stipules adnate to the petiole or connate into a leaf-opposed sheath; inflorescence usually a dense cylindric spike, rarely a raceme, terminal or opposite the leaves; flowers usually sessile.

Species about 600, spread through the warmer regions of both hemispheres; 2 species in South Africa, extending from Swellendam to Natal and the northern Transvaal; one of these extends into tropical Africa, the other to the Mascarene Islands.

1866

2. PEPEROMIA, Ruiz. & Pav.

Flowers bisexual. *Perianth* 0. *Stamens* 2; filaments short; anther-thecae 2, usually confluent. *Ovary* sessile, obtuse or acute; stigma undivided, often penicillate. *Fruit* minute.

Annual or perennial herbs, sometimes climbing; leaves alternate, opposite or verticillate, entire, pinni-nerved or 3-nerved; stipules 0; inflorescence a spike, terminal or opposite the leaves, solitary or several together; bracts sessile, usually peltate.

Species about 400, spread through the warmer regions of both hemispheres, concentrated in America; 5 species in South Africa, extending from the Cape to Natal and the Transvaal: 3 of them found outside South Africa.

36. SALICACEÆ.

Plants dioecious. *Perianth* 0. *Disc* cup-shaped or reduced to scales. *Male flowers*: *Stamens* 2 to many; filaments free or more or less united; anthers small, ovate or oblong, opening by 2 longitudinal slits. *Ovary* rudimentary or none. *Female flowers*: *Ovary* superior, sessile or shortly stalked, 1-chambered, with many ovules on 2-4 parietal placentas; style short or very short, 2-4-fid; stigmas 2-4, short, thick, emarginate or 2-fid. *Fruit* an ovoid or oblong capsule, often acuminate, dehiscent by 2-4 valves. *Seeds* many, small, with a basal tuft of hairs; endosperm 0.

Trees or shrubs; leaves alternate, entire, toothed, more rarely lobed; stipules free, sometimes small and deciduous, sometimes foliaceous and long persistent; flowers in erect or pendulous spikes or catkins; bracts membranous.

Genera 2, with about 210 species, mostly natives of the temperate and cold northern hemisphere.

1873

1. SALIX, Linn.

Flowers unisexual. *Perianth* 0. *Disc* reduced to 1 or several scales, sometimes cohering at the base. *Male flowers*: *Stamens* 2 or in a few species 3 to many. *Female flowers*: *Ovary* sessile or stalked; ovules often 4-8, arranged on 2 placentas; style often short, with 2 short retuse or 2-fid branches. *Fruit* a 2-valved capsule. *Seeds* with a basal tuft of hairs.

Trees or shrubs ; leaves often small or narrow, entire or serrulate ; stipules various ; catkin often erect, dense.

Species about 180-190, mostly natives of the northern hemisphere ; 4 species in South Africa, extending from S.W. Africa through the coastal districts to Natal and into the Transvaal, the O.F.S., and Basutoland ; also found in the central districts.

37. MYRICACEÆ.

Flowers unisexual. *Perianth* 0. *Male flowers* : *Stamens* 2 to many, often 4-6 ; filaments short, free, or more or less cohering ; anthers erect, ovate, opening by 2 longitudinal slits. *Ovary* rudimentary. *Female flowers* : *Perianth* 0. *Ovary* sessile, 1-chambered, with 1 basal erect ovule ; style short ; stigmas 2, filiform or rarely abbreviated. *Fruit* a drupe, globose or ovoid, usually warted, often waxy. *Seed* with a thin coat ; endosperm 0.

Trees or shrubs, often aromatic ; leaves alternate, entire, serrate, irregularly toothed or lobed, or pinnatifid ; stipules 0 ; flowers in spikes, usually surrounded by 2-6 bracteoles ; male spikes often dense, sometimes paniced, sometimes with male flowers below and female flowers above ; female spike longer or shorter than the male spikes.

Genus 1, with about 50 species, natives of the temperate and warm regions.

1874

1. MYRICA, Linn.

Characters of family.

Species 15, chiefly in the south-western and south-eastern districts, but extending from Clanwilliam to Natal and the Transvaal.

38. ULMACEÆ.

Flowers bisexual or unisexual. *Perianth* 4-5-partite, persistent. *Stamens* 4-5, free, absent from the female flowers. *Ovary* superior, rudimentary or abortive in the male flowers, often surrounded at the base with a ring of hairs, 1-chambered, with a solitary pendulous ovule ; stigmas 2, terminal, subulate or stoutly filiform. *Fruit* fleshy. *Seed* pendulous ; endosperm present or 0 ; embryo curved.

Trees or shrubs, spiny or unarmed ; leaves alternate, stipulate, usually 3-nerved at the base ; stipules lateral, free, deciduous ; flowers in small axillary cymes, or clusters, or solitary, pedicellate.

Genera 9 ; species about 100, widely distributed, but chiefly inhabiting the warmer regions.

The South African genera all belong to the Tribe *Celtideæ*.

1. Stipules connate and sheathing the buds ; male flowers in small cymes ; female flowers solitary 3. *Chaetacme*, Planch.
Stipules lateral, free 2.
2. Pedicels of the female flowers $\frac{1}{4}$ - $\frac{3}{4}$ in. long 1. *Celtis*, Linn.
Pedicels of the female flowers about $\frac{1}{12}$ in. or less long 2. *Trema*, Lour.

1898

1. CELTIS, Linn.

Flowers bisexual or unisexual. *Perianth-segments* 4-5, spreading. *Stamens* 4-5, opposite the perianth-segments. *Ovary* superior ; stigmas sessile, filiform or subulate, very stout, widely spreading or ascending. *Seed* without endosperm.

Trees or shrubs, unarmed or spiny ; leaves alternate, stipulate ; stipules lateral, free, deciduous ; flowers in small axillary clusters or solitary.

Species about 60, widely distributed in tropical and temperate regions ; 2 species in South Africa, extending from Port Elizabeth to Natal, Basutoland, and the Transvaal.

1902

2. TREMA, Lour.

Flowers unisexual. *Perianth-segments* usually 5, rarely 4, sub-equal or the outer slightly smaller. *Stamens* 5, rarely 4 ; filaments shorter than the perianth-segments. *Ovary* sessile, surrounded by a ring of hairs at the base ; stigmas filiform or subulate. *Seed* with endosperm.

Trees or shrubs, without stinging hairs or spines ; leaves alternate, stipulate, often 3-nerved at the base ; stipules lateral, free, deciduous ; flowers in small dense axillary cymes or clusters.

Species about 40, widely distributed in tropical and subtropical regions ; 1 species in South Africa, extending from Komgha to Natal and the Transvaal.

1906

3. CHÆTACME, Planch.

Flowers unisexual. *Perianth-segments* 5, deeply concave, with inflexed sides and all equal in the male, flattish and one smaller than the others in the female. *Stamens* 5, included in the cavity of the perianth-segments. *Ovary* sessile ; stigmas filiform, long and densely hairy-stigmatose. *Seed* without endosperm.

Trees or shrubs, spiny, without stinging hairs ; leaves alternate, stipulate ; stipules connate and sheathing the bud, deciduous as the bud expands ; male flowers in small axillary cymes or clusters ; female solitary, axillary.

Species 2, one in tropical and South Africa, the other in Madagascar. The South African species is found from Uitenhage to Natal.

39. MORACEÆ.

Plants monœcious or diœcious. *Perianth* of 2-6 free segments, or 2-6-lobed or -toothed, or tubular, or urceolate, or absent. *Stamens* 2-6, free, opposite the perianth-segments, absent from the female flowers. *Ovary* free, 1-chambered, with a solitary pendulous ovule, rudimentary or absent in the male flowers ; stigmas 2, equal or unequal, subulate or filiform, or style entire or bifid at the tip. *Fruit* either compound and globose, or oblong and formed from the enlarged fleshy perianth-segments and outer coat of the ovary, or of achenes immersed in a flattened receptacle or enclosed in a globose or pear-shaped receptacle (*fig*). *Seed* pendulous, with or without endosperm ; embryo curved.

Trees or shrubs, usually with milky juice ; leaves alternate, rarely some opposite, simple or digitately compound, stipulate, deciduous or evergreen ; flowers, in the indigenous South African species, in dense globose heads, or enclosed in the receptacle (*fig*).

Genera about 64 ; species about 950, widely distributed throughout the warmer regions.

- | | |
|---|--------------------------------|
| 1. Leaves digitately compound | 3. <i>Cannabis</i> , Linn. |
| Leaves simple | 2 |
| 2. Flowers in dense globose heads | 1. <i>Cardiogyne</i> , Bureau. |
| Flowers completely enclosed in a globose or pear-shaped receptacle (<i>fig</i>) | 2. <i>Ficus</i> , Linn |

1924

1. CARDIOGYNE, Bureau.

Plants diœcious. *Perianth-segments* 4, imbricate. *Stamens* 4, opposite the perianth-segments and longer than them, inflexed in bud, absent from the female flowers. *Ovary* sessile ; style terminal, filiform. *Fruit* compound,

globose, pulpy, formed from the enlarged perianth-segments and bracts of the combined head of flowers, with the achenes embedded in the pulp. *Achenes* ellipsoid, notched at the apex. *Seed* with endosperm.

A climbing shrub or bush; leaves alternate, inconspicuously stipulate; flowers in dense globose heads solitary or in pairs in the axils of the leaves.

Species 1, recorded from tropical eastern South Africa, but extends northwards.

1961

2. *FICUS*, Linn.

Plants monoecious or very rarely dioecious. *Male flowers*: *Perianth* 2-6-lobed or -partite; lobes or segments imbricate, usually membranous and hyaline. *Stamens* 1-2, rarely 3-6. *Ovary* 0, or very rarely present and rudimentary. *Female flowers*: *Perianth-segments* often fewer and narrower than in the male or rarely minute. *Ovary* mostly obliquely-ellipsoid or ovoid; style almost invariably lateral; stigma usually oblong. *Achene* partially enclosed within the persistent perianth.

Trees or shrubs- or rarely climbers, with milky juice; leaves alternate or very rarely opposite; stipules enveloping the terminal bud, caducous at the unfolding of the leaves or more rarely persistent; receptacles (*fig*) sessile or pedunculate, mostly paired when axillary or sometimes solitary, when borne on the trunk or main branches remote from the leaves then in leafless panicles or more usually in fascicles; bracts at the ostiole (mouth) of the receptacle in several series, spreading horizontally across the mouth and then visible from outside, or all descending abruptly into the interior of the receptacle and not visible from outside.

Species over 800 spread throughout the tropics and sub-tropics of both hemispheres, very numerous (about 801) in tropical Africa; 20 species in South Africa, found in the coastal belt from S.W. Africa to Natal and extending into the Transvaal.

1973

3. *CANNABIS*, Linn.

Plants dioecious. *Male flowers*: *Perianth* 5-parted; segments imbricate. *Stamens* 5; filaments very short, erect; anthers oblong. *Ovary* 0. *Female flowers*: *Perianth* hyaline, embracing the ovary, or 0. *Ovary* sessile; style central, divided into 2 filiform caducous lobes. *Fruit* a compressed crustaceous achene. *Seed* flattened; embryo curved; endosperm unilateral.

A tall erect annual herb; leaves alternate or the lower opposite; upper leaves 1-3-partite; lower leaves 5-11-partite; all serrated; stipules lateral; male flowers fasciated in short pendulous panicles; female flowers crowded under leafy convolute bracts.

Species 1, native of Asia; naturalised in South Africa.

40. URTICACEÆ.

Plants monoecious or dioecious. *Flowers* unisexual, rarely with occasional bisexual flowers. *Perianth* simple, of 1-5 segments, sometimes absent in the female flowers. *Male flowers*: *Stamens* as many as the perianth-segments; filaments broadened at the base, bent inwards in the bud; anthers ovate, dorsifixed, opening by longitudinal slits. *Female flowers*: *Ovary* superior, 1-chambered, with 1 erect straight ovule; style simple or 0; stigma capitate and tuft-like or penicillate, or more or less elongated. *Fruit* a small achene, more or less enveloped by the persistent perianth. *Seed* with a thin coat; endosperm usually present.

Herbs, shrubs, or rarely trees, without milky juice, sometimes with stinging or sharply pointed hairs, often with masses of crystals in the cells (cystoliths); leaves alternate or opposite, simple; stipules usually present; inflorescence various.

Genera 42, with about 530 species, found in all warm and temperate regions.

Tribe **Ureræ**: Herbs, shrubs, or rarely trees, very often armed with stinging or sensitive hairs; inflorescence a cyme; male flowers 4-5, rarely 2-3, merous; ovary rudimentary; female flowers 2-5-lobed or -partite, free from the achene (genera 1-3).

Tribe **Procrideæ**: Herbs, very rarely shrubby at the base, with non-stinging hairs; inflorescence a crowded glomerate cyme or head, or flowers on a discoid receptacle; male flowers 4-5, rarely 2-3, merous, surrounding the rudimentary ovary; female flowers 3-5-partite, free from the achene; staminodes often present (genus 4).

Tribe **Boehmeriæ**: Trees or shrubs or rarely herbs, with non-stinging hairs; inflorescence a head, glomerate or scattered; involucre absent; male perianth 4-5, rarely 2-3, merous, surrounding a rudimentary ovary; female perianth tubular, contracted at the mouth, enclosing the achene, or short and adpressed, or 0 (genus 5).

Tribe **Forskohleæ**: Herbs with non-stinging hairs; flowers crowded in the axils of the leaves, with or without an involucre; male flower irregular; stamen 1; female perianth tubular; enclosing the achene, or absent (genera 6-8).

- | | |
|---|------------------------------|
| 1. Leaves opposite | 2 |
| Leaves alternate | 4 |
| 2. Plants armed with stinging hairs | 1. <i>Urtica</i> , Linn. |
| Plants without stinging hairs | 3 |
| 3. Flowers all free, none enclosed in an involucre; stamens 2-4 | 4. <i>Pilea</i> , Lindl. |
| Several male and 1-3 female flowers enclosed in an involucre; stamen 1 | 7. <i>Droguetia</i> , Gaud. |
| 4. Plants armed with stinging hairs | 5 |
| Plants without stinging hairs | 6 |
| 5. Stigma linear-filiform or lanceolate | 3. <i>Fleurya</i> , Gaud. |
| Stigma a sessile head- or mop-like tuft of hairs | 2. <i>Ureria</i> , Gaud. |
| 6. Flowers all free, none enclosed in an involucre | 7 |
| Several male and 1-3 female flowers enclosed in an involucre | 8 |
| 7. Perianth of female flowers flask-shaped, 2-4 toothed at the mouth; stamens 3-5 | 5. <i>Pouzolzia</i> , Gaud. |
| Perianth of female flowers investing or adnate to the ovary so that it appears absent; stamen 1 | 8. <i>Australina</i> , Gaud. |
| 8. Lobes of involucre much longer than the flowers | 6. <i>Forskohlea</i> , Linn. |
| Lobes of involucre much shorter than the flowers | 7. <i>Droguetia</i> , Gaud. |

1974

1. URTICA, Linn.

Plants monoecious or dioecious. *Male flowers*: Perianth deeply 4-fid. *Stamens* 4. *Ovary* rudimentary, cup-shaped. *Female flowers*: Perianth 4-partite. *Ovary* straight, ovoid; style usually absent, rarely short; stigma usually sessile, penicillate-capitate, deciduous or persistent. *Fruit* ovate or oblong, compressed, included in the enlarged membranous rarely fleshy perianth.

Annual or perennial herbs, rarely woody at the base, armed with stinging hairs; leaves opposite, petioled, toothed or lobed, 5-7- or rarely 3-nerved; stipules free, very rarely connate; flowers often without bracts, in axillary 2-fid clusters with the branches short or long, simple or paniced; clusters bracteate at the base.

Species about 40, natives of temperate and sub-temperate regions; 2 species found naturalised in South Africa and two are native, found in Little Namaqualand, Uitenhage, and several of the central districts.

1978

2. URERA, Gaudlich.

Plants dioecious or rarely monoecious. *Male flowers*: *Perianth* 4-5-partite. *Stamens* 4-5. *Ovary* rudimentary, globose or almost cuplike. *Female flowers*: *Perianth* of 4 lobes or segments. *Ovary* straight or oblique; stigma sub-sessile, penicillate-capitate or very rarely sublanceolate, persistent. *Fruit* straight or oblique, compressed or ventricose, long-stalked or included in the enlarged fleshy or succulent perianth. *Seed* with a thin coat; endosperm scanty or 0.

Shrubs or trees, rarely undershrubs, often with scattered stinging hairs; leaves alternate, entire, toothed or lobed; stipules free or rarely connate; flowers in laxly paniced clusters; panicles dichotomously cymose or irregularly racemose, axillary or solitary at the nodes, shortly or long-peduncled; bracts small or 0.

Species 30, natives of tropical Africa and America, with a few in Madagascar and the Pacific Islands; 2 species in South Africa, found in Pondoland, Natal, and the Transvaal, also in the Queenstown district.

1982

3. FLEURYA, Gaudlich.

Plants monoecious or dioecious. *Male flowers*: *Perianth* 4-5-partite. *Stamens* 4-5. *Ovary* rudimentary, globose or sub-clavate. *Female flowers*: *Perianth* of 4 segments, sub-equal or unequal, with the upper sometimes cucullate and the lower very small or absent. *Ovary* straight when young, soon afterwards oblique; stigma obliquely ovate or linear, at length inflexed and hooked, shortly papillose, sometimes with 2 minute lobes at the base. *Fruit* oblique, compressed, exerted from the slightly enlarged perianth. *Seed* with a membranous coat; endosperm scarcely any.

Annual herbs, sometimes with stinging hairs; leaves alternate, petioled, toothed, 3-nerved, with linear cystoliths; stipules obsolete, very rarely intrapetiolar, connate and 2-fid; flowers in axillary spikes or panicles; bracts small.

A small genus of about 12 species, natives of tropical regions; 3 species in South Africa, extending from Uitenhage to Natal and the northern Transvaal.

1984

4. PILEA, Lindl.

Plants monoecious or dioecious. *Male flowers*: *Perianth* 2-4-partite; segments equal or unequal, with a gibbosity or obtuse subulate point on the back just below the apex on one or more of them. *Stamens* 2-4. *Ovary* rudimentary. *Female flowers*: *Perianth* as in the male. *Stamens* rudimentary, scale-like. *Ovary* straight, compressed; stigma terminal, sessile, not oblique, formed of a dense tuft of short hairs. *Fruit* a compressed achene, scarcely or not at all oblique.

Annual or perennial herbs, often creeping, not armed with stinging hairs; leaves opposite, equal or unequal in each pair; stipules connate, entire; flowers in axillary sessile clusters or in peduncled heads, cymes, or panicles.

Species about 280, widely distributed throughout the warmer regions, but absent from Australia; one species recorded from Houtbosch in the northern Transvaal.

1992

5. POUZOLZIA, Gaudlich.

Plants monoecious, rarely dioecious. *Male flowers*: *Perianth* 4-5-lobed or -partite, rarely 3-partite, concave or abruptly inflexed and transversely plicate dorsally. *Stamens* 4-5, rarely 3. *Ovary* rudimentary, clavate or oblong. *Female flowers*: *Perianth* tubular, often beaked, with the

mouth contracted and 2-4-toothed. *Ovary* included; stigma filiform, villous on one side, soon deciduous. *Fruit* included in the enlarged marcescent or scarcely changed perianth; pericarp shining. *Seed* with a thin coat; endosperm scanty or 0.

Shrubs or undershrubs; leaves alternate or very rarely the lower all opposite, often entire, 3-nerved; the upper gradually smaller and passing into bracts; stipules free, often persistent; flowers more or less stalked, in sessile axillary clusters; bracts small.

Species about 60, natives of tropical regions; 2 species in South Africa, ranging from the Transkei to Natal and the Transvaal.

2012

6. FORSKOHLEA, Linn.

Plants monoecious. *Flowers* embedded in wool, with a more or less campanulate involucre. *Male flowers* stalked, many, forming an outer ring. *Perianth* club-shaped in bud, afterwards irregularly 3-lobed or 3-toothed; the middle lobe sub-erect or inflexed. *Stamen* 1. *Ovary* 0. *Female flowers* sessile, 1-5 in the centre of the male involucre. *Perianth* 0. *Ovary* straight; stigma filiform, papillose-hispid, long-persistent. *Fruit* ovate, compressed, woolly, enclosed in the involucre. *Seed* with a thin coat; endosperm scanty or absent.

Herbs, sometimes woody at the base, often more or less hispid; leaves alternate, toothed, often whitish-tomentose beneath, with the mid-rib branching into 3; stipules free; involucre generally several, sessile at the nodes, bearing long silky hairs on the outside; bracts generally 3-6, free or connate below.

A genus of 6 species, mostly African; also found in Arabia, Western India, and 1 species in south-east Spain; 2 species in South Africa, found in South-West Africa and the central districts, but also recorded from Riversdale.

2013

7. DROGUETIA, Gaudlich.

Plants monoecious, sometimes dioecious. *Androgynous involucre* few- to many-flowered, bowl-shaped, campanulate or ventricose, with toothed margins; female involucre 1- or 2-flowered, ventricose. *Male flowers* few to many, shortly stalked. *Perianth* tubular, club-shaped in bud, becoming 3-lobed above in flower. *Stamen* 1. *Ovary* 0. *Female flowers* sessile, 1 or few in the centre of the involucre. *Perianth* 0. *Ovary* straight; stigma filiform, shortly papillose on one side, persistent during the ripening of the fruit. *Fruit* included in the involucre, woolly or smooth, ovate, compressed. *Seed* with a thin coat; endosperm present.

Herbaceous or somewhat shrubby perennials; leaves alternate or opposite, stalked, crenate-serrate, 3-nerved, with dot-like cystoliths; stipules lateral, free; involucre sub-sessile, shortly pubescent; the androgynous in pairs in the leaf axils; the female borne at the base of an undeveloped axillary shoot.

Species about 12, natives of Africa, Arabia, Madagascar, India, and Java; 5 species in South Africa recorded from Swellendam to Natal.

2014

8. AUSTRALINA, Gaudlich.

Plants monoecious. *Male flowers* few to many, sessile or sub-sessile. *Perianth* club-shaped in bud, after opening tubular below, with a broad outer acuminate lobe, or ultimately splitting almost to the base. *Stamen* 1. *Ovary* 0. *Female flowers* few, sessile. *Perianth* sac-like, enveloping the ovary, with a contracted minutely toothed mouth, or 0. *Ovary* straight;

stigma filiform or narrow-linear. *Fruit* included in the membranous or slightly fleshy perianth, or naked. *Seed* with a thin coat; endosperm very scanty.

Diffuse annual or perennial herbs; leaves alternate or opposite, stalked, toothed; stipules lateral, free, or sometimes joined below; flowers in axillary clusters; male flower-clusters sessile or stalked; female sessile.

Species about 10, natives of Africa, Australia, and New Zealand; 6 species found in South Africa from Little Namaqualand through the coastal belt to Natal; also recorded from Somerset East.

41. PROTEACEÆ.

Flowers bisexual, or unisexual and then plants dioecious, rarely flowers unisexual with occasional bisexual flowers. *Perianth* of 4 segments, regular or more or less irregular, valvate, usually tubular in bud. *Stamens* 4, seated in the spoonlike depressions of the perianth-lobes (at least in the South African species); anthers free, very rarely laterally cohering. *Ovary* superior, sessile or stalked, with or without hypogynous scales or an annular or cupular disc at the base, 1-chambered, sometimes oblique or excentric, with 1 or more pendulous or laterally attached ovules; style short or more often long; stigma various. *Fruit* a nut, drupe, follicle, or capsule. *Seeds* several, or 2, or 1, often compressed and winged; endosperm 0.

Trees or shrubs, rarely perennial herbs; leaves spirally arranged, rarely verticillate or opposite, entire or variously and sometimes decompoundly divided; stipules 0; inflorescence in racemes, umbels, spikes, or small or large often involucrate heads.

Over 50 genera with nearly 1,000 species, mostly massed in South Africa and Australia, a few in tropical Africa, the Indo-Malayan region, the Pacific Islands and South America.

Tribe Personiceæ: Flowers solitary in the axils of the leaves, or in bracteate racemes or spikes; perianth regular, with the segments separating as the flower opens, or soon afterwards; ovules 2 or 1, pendulous, rarely laterally attached; fruit an indehiscent nut or drupe (genus 1).

Tribe Proteeæ: Flowers solitary or in the axils of bracts, usually in heads, more rarely in spikes or racemes; perianth regular or more or less irregular, with all the segments more or less deeply separating or with only one detaching itself from the remainder of the perianth; ovule 1, laterally attached or ascending, fruit a dry nut, sometimes winged (genera 2-14).

Tribe Grevilleæ: Inflorescence a raceme, or flowers in fascicles; involucre absent or inconspicuous; bracts deciduous; ovules 2, rarely 4, collateral (genus 15).

- | | |
|---|---|
| 1. Leaves in whorls of 6 | 1. <i>Brabeium</i> , <i>Lin.</i> |
| Leaves alternate | 2 |
| 2. Flowers unisexual | 3 |
| Flowers bisexual | 5 |
| 3. Male flowers in spike-like racemes; female flowers in heads sur-
rounded by subulate bracts | 14. <i>Aulax</i> , <i>Berg.</i> |
| Male flowers in conical globular or cylindric heads; female aggre-
gated in cone-like heads | 13. <i>Leucadendron</i> , <i>R. Br.</i> |
| 4. Ovules 2 | 15. <i>Hakea</i> , <i>Schrad.</i> |
| Ovule solitary | 5 |
| 5. Perianth separating into a lower segment and an upper portion
consisting of the fused upper segment and the two lateral
segments | 6 |
| Perianth regular or slightly irregular; the 4 segments distinct | 8 |
| 6. Inflorescence a spike or raceme | 10. <i>Faurea</i> , <i>Harr.</i> |
| Inflorescence a head | 7 |

7. The upper and lateral perianth segments fused all the way up, so that the 3 stamens are situated in a single spoon-like depression and cohere laterally, toothed or awned at the apex; leaves never toothed 11. *Protea*, Linn.
The upper and lateral perianth-segments fused, but the 3 limbs free, each containing a stamen; leaves often toothed at the apex 12. *Leucospermum*, R.Br.
8. Involucral bracts large, red; the outermost shaggy; heads terminal, many-flowered 6. *Orothamnus*, Pappe
Involucral bracts usually small, if large then whitish and glabrous 9
9. Heads 3-12-flowered, massed in the axils of the upper leaves and partly hidden by them 5. *Mimetes*, Salisb.
Heads few- or many-flowered, solitary, axillary or terminal or arranged in spikes, racemes, panicles, or corymbs 10
10. Involucre cup-like, more or less bilabiate; the bracts never imbricate 11
Involucral bracts imbricate, when only 4 then the 2 lateral outside 12
11. Perianth slightly irregular; the upper lobe being larger and more densely villous or bearded than the others; ovary somewhat oblique; stigma obliquely discoid 8. *Spatalla*, Salisb.
Perianth regular; ovary not oblique; stigma obliquely capitate 9. *Spatallopsis*, Phill.
12. Heads always 4-flowered, arranged in cylindric rarely sub-globose spikes; involucral bracts 4, with the 2 lateral ones outside the other 2 3. *Paranomus*, Kn.
Heads few- (2-7) or many-flowered, either solitary, or arranged in short dense spikes or racemes, or in a panicle or corymb 13
13. Heads solitary, sessile or peduncled, axillary or terminal 14
Heads in terminal corymbs or panicles or in short dense globose spikes or racemes 15
14. Leaves entire, flat, rarely ericoid or minutely toothed at the apex 7. *Diastella*, Kn.
Leaves much dissected into cylindric segments, rarely entire 4. *Serruria*, Salisb.
15. Heads in short dense globose spikes or racemes 2. *Sorocephalus*, R.Br.
Heads in terminal corymbs or panicles 4. *Serruria*, Salisb.

2024

1. BRABEIUM, Linn.

Flowers bisexual, with occasional unisexual flowers, actinomorphic. *Perianth* cylindric in bud, with a globose limb; segments 4, separating to the base on flowering, spatulate-linear. *Ovary* sessile, long-hairy; style terete, clavate above; stigma small, terminal. *Fruit* a drupe, densely velvety. *Seed* solitary.

A small tree or shrub; leaves in whorls of 6, undivided, serrate; inflorescence a dense spike-like axillary raceme; flowers pedicelled, 2-nate in the axils of early deciduous bracts.

Endemic; species 1, ranging from Tulbagh to Riversdale

2028

2. SOROCEPHALUS, R. Br.

Flowers bisexual, regular. *Perianth* cylindric in bud, 4-partite to near the base, usually villous, more rarely pubescent or glabrous. *Ovary* sessile or shortly stalked, hairy; style straight, often constricted at the base, glabrous; stigma terminal, conical, ellipsoid, or sub-globose, obtuse. *Fruit* usually a glabrescent shining ellipsoid or cylindric sessile or shortly stalked nut.

Small erect shrubs; leaves terete or sub-terete, rarely quite flat, smooth or slightly scabrous; inflorescence a 2-6-flowered head; heads in dense short spikes or racemes, each head subtended by a glabrous or hairy bract; floral bracts free from one another.

Endemic; species 13, ranging from Tulbagh to Swellendam.

2029

3. PARANOMUS, Kn.

(Nivenia, R. Br.)

Flowers bisexual, regular. *Perianth* hairy, cylindric in bud, 4-partite to near the base; tube short, nearly glabrous, rarely villous. *Ovary* sessile, pubescent, surrounded by a basal ring of hairs; style straight, glabrous or hairy on part of its length; stigma narrowly clavate or sub-ellipsoid, gradually passing into the style, rarely broadly ovoid and capitate. *Fruit* a smooth ivory-white shining nut, with a basal ring of hairs, often beaked and tipped by the persistent basal portion of the style.

Small erect shrubs; leaves all alike and much dissected, or the lower leaves dissected and the upper leaves broadly spatulate or flabellate; inflorescence a 4-flowered head; heads arranged in terminal usually solitary sessile or pedunculate cylindric rarely sub-globose spikes; floral-bracts 4, with the 2 side ones overlapping the front and back ones.

Endemic; species 13, ranging from Clanwilliam to Uitenhage.

2030

4. SERRURIA, Salisb.

Flowers bisexual, regular. *Perianth-segments* free or slightly connate at the base, usually villous or hirsute; the upper limb often glabrous or more shortly pubescent than the other 3. *Ovary* sessile or very shortly stipitate, villous or pubescent; style straight, glabrous or rarely pubescent in the lower part; stigma sub-clavate or cylindric, gradually tapering into the style. *Fruit* an ovoid or sub-globose nut.

Shrubs, erect or more rarely prostrate; leaves often much dissected into cylindric acute segments, rarely entire; inflorescence a head; heads in terminal corymbs or panicles on a common peduncle or solitary on simple axillary and terminal peduncles, often with a small involucre of barren bracts.

Endemic; species 50, extending from Clanwilliam to George, but mostly massed in the south-western districts.

2031

5. MIMETES, Salisb.

Flowers bisexual, regular. *Perianth-tube* very short or wanting; segments filiform or linear-filiform, often villous. *Ovary* sessile, pubescent; style exserted, mostly glabrous, usually terminal, rarely oblique; stigma smooth, terete or linear, rarely sub-4-angled, sometimes swollen at the apex, more or less kneed or sinuate at the junction with the style. *Fruit* ovoid, glabrescent.

Erect or sub-decumbent undershrubs, sometimes large bushes; stems tomentose or villous; leaves alternate, entire or 3-dentate at the apex, mostly densely adpressed silky-tomentose or villous; inflorescence a head of 3-12 flowers; the heads solitary and massed in the axils of the upper leaves; involucre bracts shorter than the flowers, often villous or tomentose, frequently coloured.

Endemic; species 10, extending from Tulbagh to Knysna.

2031a

6. OROTHAMNUS, Pappe.

Flowers bisexual, regular. *Perianth-tube* short, pubescent; segments linear. *Ovary* sessile; style erect, grooved, glabrous; stigma linear, grooved, obtuse.

An erect shrub, with long-pilose branches; leaves ciliate; inflorescence a many-flowered head; heads at the extremities of the branches; involucral bracts large, coloured; the outermost shaggy.

Endemic; species 1, only known from the Hottentots Holland Mountains in the Caledon district.

2031b

7. DIASTELLA, Kn.

Flowers bisexual, regular. *Perianth* cylindric in bud; segments free to slightly connate at the base, villous. *Ovary* sessile, pubescent; style straight, sub-persistent, glabrous or pilose in the lower part; stigma cylindric, short, obtuse, gradually tapering into the style. *Fruit* a yellowish-white ellipsoid beaked nut.

Erect or prostrate undershrubs or shrubs; branches pilose or villous; leaves spatulate or sub-orbicular, rarely ericoid, entire or sometimes minutely toothed at the apex, usually hairy; inflorescence a head, terminal, solitary; involucre bracts never or only slightly exceeding the flowers, ciliate, mostly coloured.

Endemic; species 5, extending from Tulbagh to Caledon.

2032

8. SPATALLA, Salisb.

Flowers bisexual, slightly irregular. *Perianth* cylindric in bud, 4-partite to below the middle, rarely only to the middle, always with a distinct tube; the upper lobe larger and thicker than the others, all more or less equally hairy. *Ovary* somewhat oblique, sessile or very shortly stalked, hairy; style terete, often slightly bent towards the apex, glabrous; stigma very small, situated in the middle of a flat or concave oblique usually obovate disc. *Fruit* a pubescent brown shortly stipitate ovoid or ellipsoid nut.

Usually small erect or spreading shrubs; leaves ericoid or needle-shaped, entire, straight or curved, hairy or glabrous; inflorescence a 1-4-flowered head; heads in the axils of linear or lanceolate bracts, in terminal sessile or pedunculate spikes or racemes; involucre cup-like and 2-lipped or 3-toothed, 3-lobed, or 3-partite nearly to the base.

Endemic; species 21, extending from Clanwilliam to George, but mostly massed in the south-western districts.

2032a

9. SPATALLOPSIS, Phill.

Flowers bisexual, regular. *Perianth* tomentose or villous, cylindric in bud, 4-partite to below the middle; tube glabrous or nearly so. *Ovary* sessile or sub-sessile, hairy; style often slightly bent towards the apex, glabrous; stigma conical or sub-clavate, terminal. *Fruit* as in *Spatalla*.

Small erect or spreading shrubs; leaves ericoid or needle-shaped, entire; inflorescence a 3-4-flowered head: heads arranged in terminal spikes or racemes; involucre cup-shaped, more or less regularly 4-partite to near the base; subtending bract linear to ovate.

Endemic; species 5, ranging from Clanwilliam to Caledon.

2034

10. FAUREA, Harv.

Flowers bisexual, zygomorphic. *Perianth* tubular in bud, with an oblong or obovoid to clavate limb, at length split by the lengthening style into a lower segment and an upper portion consisting of the fused upper segment and the two side segments; the 3 limbs of the upper portion cohering or more or less separating. *Ovary* ovoid or ellipsoid, covered with long hairs; style more or less curved, glabrous, persistent; stigma terete or quadrangular, gradually passing into the style or with a small bend at the junction with the style. *Fruit* a long-villous nut.

Trees or shrubs; leaves alternate, petioled, entire; inflorescence a terminal solitary raceme or spike, with each flower subtended by a small bract; perianth at length deciduous.

Species about 14, mostly in tropical Africa; 1 species in Madagascar, and 4 species in South Africa, extending from Knysna to Natal and the Transvaal.

2035

11. PROTEA, Linn.

Flowers bisexual, zygomorphic. *Perianth* tubular in bud, more or less widened towards the base, dividing into a single lower segment with a long very slender claw, and an upper portion consisting of the fused upper segment and the 2 side segments; the tip of the upper portion equally or unequally 3-lobed and containing 3 of the stamens; the lobes either short, tooth-like, or produced into awn-like and very hairy processes. *Ovary* covered with long hairs; style rigid, straight or curved, terete or laterally compressed, sometimes bulbously thickened at the base, glabrous or hairy; stigma slender, gradually passing into the style, or suddenly bent, or kneed at the junction with the style. *Nut* densely bearded, crowned by the persistent style.

Small trees, or shrubs, or stemless plants, rarely trailing; leaves alternate, entire; flowers in many-flowered usually solitary heads, enclosed in an involucre of numerous imbricate bracts; bracts glabrous or hairy, rarely viscid, sometimes bearded; receptacle flat, convex, or conical.

Species about 100, mostly in the south-western parts of the Cape Province, but also found in tropical Africa; 86 species in South Africa, mostly massed in the south-western districts, but extend into Natal, the Transvaal, Basutoland, and Swaziland.

2036

12. LEUCOSPERMUM, R. Br.

Flowers bisexual, sub-zygomorphic, rarely quite actinomorphic. *Perianth* cylindric in bud, at length split by the lengthening style into a lower segment and an upper portion consisting of the fused upper segments and the two side segments, but separated at the tip into 3 distinct lobes, each lobe containing a stamen; lobes recurved or revolute in the open flower. *Ovary* sessile, pubescent, surrounded by a basal ring of hairs; style straight or nearly so in open flowers, always much curved in opening flowers; stigma conical, ovoid, or obliquely turbinate, or cylindric, large or small. *Fruit* a smooth whitish, often shining, nut.

Large bushes, shrubs, or sometimes procumbent or trailing; leaves usually very crowded, entire or toothed at the apex, glabrous or variously hairy; flowers in heads, each subtended by a bract, or the lowermost bracts barren and forming a more or less distinct involucre; heads usually solitary, more rarely in groups of 2-3.

Species about 33; all, with the exception of 2 species found in Rhodesia and tropical Africa, occur in South Africa. Mostly massed in south-western districts, but extend into Natal and the northern Transvaal; 1 species found in Little Namaqualand.

2037

13. LEUCADENDRON, R. Br.

Plants dioecious, regular. *Male flowers* with a linear perianth and with the segments at length separated to the middle or nearly to the base. *Ovary* rudimentary; style short, slender; stigma clavate, entire or slightly bifid. *Female flowers* with a perianth more or less as in the male. *Staminodes* usually linear. *Ovary* ovoid, 3-angled, or compressed; style usually slender and gradually widened towards the apex, usually persistent; stigma terminal, oblique, or lateral, entire or bifid, rarely 2-lobed. *Fruit* ovoid, transversely ellipsoid, 3-angled, flattened, or winged, sometimes emarginate.

Trees, shrubs, or undershrubs; leaves various, glabrous, pilose, or clothed with adpressed silky silvery hairs; male flowers arranged in conical globular

or cylindric heads ; each flower subtended by a bract ; heads terminal, sessile or rarely pedunculate : female flowers solitary, subtended by woody bracts aggregated in cone-like heads.

Endemic ; species 82, chiefly massed in the south-western districts and extending as far as Uitenhage ; 1 species is recorded from Natal.

2038

14. AULAX, Berg.

Plants dioecious. *Flowers* actinomorphic. *Male flowers* with the perianth very indistinctly differentiated into tube and limb, separating into 4 linear segments on opening. *Ovary* rudimentary, small, with a subulate style thickened upwards. *Female flowers* with a perianth consisting of a sub-angular elongate-conical tube and 4 more or less spreading or recurved lobes. *Staminodes* inserted at the base of the limb, very short, filiform. *Ovary* oblong-ovoid, densely covered with long hairs ; style sub-clavate upwards ; stigma lateral at the end of the style. *Nut* somewhat compressed, angular, hairy.

Glabrous densely leafy shrubs ; leaves scattered, undivided, entire, narrow ; male flowers in spike-like bracteate racemes, terminal on leafy brachlets, which are usually gathered into fascicles or pseudo-whorls at the end of longer shoots ; female flowers in heads with a central axis and surrounded by subulate bracts.

Endemic ; species 3, extending from Tulbagh to Knysna.

2047

15. HAKEA, Schrad.

Flowers bisexual, irregular, rarely regular. *Perianth-tube* twisted or recurved, rarely straight ; segments soon free to the base ; lobes cohering for some time. *Anthers* sessile in the depressions of the lobes, ovate or oblong, with the connective not produced beyond the thecae. *Hypogynous disc* fleshy, unilateral, semi-annular, sometimes small. *Ovary* sub-sessile ; style sometimes elongated and projecting from the fissure of the perianth-tube and adhering to the perianth-lobes above, or sometimes straight and shorter than the perianth ; stigma thickened, sometimes dilated into an oblique lateral disc, with the stigmatic surface small in the centre of the disc, sometimes straight and conical with the stigmatic surface terminal ; ovules 2, laterally attached. *Fruit* a capsule, hard, often woody, opening at the apex by 2 valves. *Seeds* 2 (or solitary by abortion), winged.

Shrubs, rarely trees ; leaves alternate, heteromorphous, leathery, rigid, terete or flat, entire, toothed or variously dissected : inflorescence a short or long sessile raceme, axillary, rarely terminal, or the flowers in axillary, rarely terminal, fascicles.

An Australian genus of about 100 species ; some species naturalised in South Africa and found near Cape Town, Knysna, Van Stadens, Grahamstown, King William's Town, and in Natal.

42. LORANTHACEÆ.

Flowers regular or zygomorphic, bisexual or unisexual. *Calyx* gamosepalous, lobed or truncate, sometimes obsolete. *Corolla* polypetalous or gamopetalous, petaloid or sepaloid, valvate in bud. *Stamens* as many as and opposite the petals or corolla-lobes and inserted on them ; anthers usually 2-theous, sometimes divided into numerous small thecae. *Disc* superior, annular, or 0. *Ovary* inferior, usually without a distinct placenta and ovules ; style simple

or 0; stigma not or hardly lobed. *Fruit* baccate (in all the African species), crowned by the persistent calyx when the latter is present; pericarp sticky. *Seed* solitary; endosperm present or 0.

Green shrubs or more rarely herbs, parasitic on other plants, very rarely trees; leaves opposite, ternate, or alternate, simple, entire, sometimes reduced to mere scales or teeth; stipules 0; inflorescence a raceme or cyme; flowers often large and brightly coloured, or small greenish and inconspicuous.

Genera about 27, with about 1,000 species chiefly tropical and sub-tropical.

Tribe **Euloranthææ**: Flowers bisexual or unisexual by abortion; perianth double; calyx-limb more or less distinct, annular or shortly cupular (genus 1).

Tribe **Viscææ**: Flowers unisexual; perianth simple (genus 2).

Flowers bisexual; calyx present though sometimes reduced to a small rim; style long 1. *Loranthus*, Linn.

Flowers unisexual; calyx obsolete; style short or none . 2. *Viscum*, Linn.

2074

1. LORANTHUS, Linn.

Flowers bisexual. *Calyx* more or less lobed or truncate, sometimes very short, occasionally provided inside at the base with a fleshy annular thickening. *Corolla* polypetalous or more frequently gamopetalous, regular or zygomorphic; tube often split unilaterally for some distance downwards when the flower opens. *Filaments* united in their lower part with the petals. *Style* filiform or sometimes skittle-shaped above; stigma truncate or more or less capitate. *Fruit* baccate, usually globose, ovoid, or ellipsoid, crowned by the persistent calyx. *Seed* with endosperm; embryo straight, terete.

Green leafy parasites; leaves opposite, ternate, or alternate; inflorescence (in the African species) a raceme, spike, umbel, or head; subtending bract of each flower situated at the apex of the pedicel when the latter is present; flowers often large and brightly coloured.

Species about 500, mostly tropical and sub-tropical, a few in South Europe, temperate Asia, Australia, New Zealand, in the Pacific Islands and South America; 23 species in South Africa, widely distributed over the Union.

2093

2. VISCUM, Linn.

Plants monoecious or dioecious. *Calyx* absent or represented by a mere rim. *Corolla* regular. *Male flowers* in parts of 3 or 4. *Receptacle* more or less hollowed. *Corolla* polypetalous, but usually appearing gamopetalous; petals 3 or 4, more or less triangular. *Anthers* sessile, adhering by their dorsal surface to the lower part of the petals and the upper part of the receptacular tube. *Female flowers*: *Corolla* superior, polypetalous; petals 3-4, deciduous or persistent. *Ovary* inferior; style short or 0; stigma thick, cushion-shaped. *Berry* crowned by the petals or not. *Seed* with endosperm; embryos 1-3, terete.

Green leafy or, at first sight, leafless shrubs, parasitic on other plants; branches usually much forked, jointed immediately above the nodes; internodes often compressed, angled or not; leaves opposite, well developed or represented by small scales; inflorescence axillary, or axillary and terminal, consisting of solitary or fascicled flowers or cymules; cymules peduncled or sessile, 3-9-flowered; flowers small, green, yellow, or white; berries red, orange, yellow, or white.

Species about 60, all Old World, mostly natives of warm regions; 20 species in South Africa, fairly widely distributed over the Union.

43. SANTALACEÆ.

Flowers bisexual or rarely unisexual by abortion, regular. *Perianth* simple, sometimes fleshy; segments usually 4-5 (rarely 3), with (in the South African genera) a tuft of hairs inside at the back of the anthers; valvate in the bud. *Stamens* as many as the perianth-segments, inserted at or below their base. *Disc* epigynous or perigynous, prominent or obscure. *Ovary* inferior, 1-chambered, with 2-4, rarely 5, pendulous ovules from a free-central placenta; style short or cylindric; stigma terminal, capitate or 2-5-lobed. *Fruit* indehiscent, dry or fleshy. *Seed* globose or ovoid; endosperm copious; radicle superior.

Herbs, shrubs, or trees, often parasitic; leaves usually alternate, entire; stipules 0; inflorescence axillary or terminal; flowers minute, usually greenish.

Genera about 27; species about 400, spread throughout the temperate and tropical regions of both hemispheres.

Tribe **Osyrideæ**. Fruit succulent; stamens equal in number to the perianth-segments (genera 1-3).

Tribe **Thesieæ**. Fruit dry; stamens equal in number to the perianth-segments (genera 4-5).

- | | |
|---|---------------------------------|
| 1. Leaves opposite; disc prominent; fruit a succulent drupe . . . | 2 |
| Leaves alternate; disc obscure, rarely prominent; fruit a succulent | |
| drupe or dry | 3 |
| 2. Perianth 3-4-lobed; ovules 2-4 | 1. <i>Osyris</i> , Linn. |
| Perianth 5-lobed; ovules 5 | 2. <i>Rhoiocarpus</i> , A.DC. |
| 3. Fruit succulent | 4 |
| Fruit dry and ribbed | 5 |
| 4. Perianth 3-4-lobed; stamens 3-4 | 1. <i>Osyris</i> , Linn. |
| Perianth 5-lobed; stamens 5 | 3. <i>Osyridicarpus</i> , A.DC. |
| 5. Flowers bisexual; perianth-segments and stamens 5 | 5. <i>Thesium</i> , Linn. |
| Flowers unisexual; perianth-segments and stamens 4 | 4. <i>Thesidium</i> , Sond. |

2108

1. OSYRIS, Linn.

Flowers bisexual or unisexual by abortion. *Male flowers* with a short and solid perianth-tube. *Stamens* 3-4, inserted at the base of the segments. *Female flowers* with a 3-4-lobed perianth, adnate to the ovary; segments deltoid, with a tuft of hairs on the face attached to the back of the anthers, valvate in bud. *Disc* flat, angled between the stamens. *Ovary* with 2-4 ovules pendulous from a short central placenta; style short or long; stigma 3-4-fid. *Fruit* a drupe, globose, crowned with the persistent perianth-segments; endosperm fleshy.

Glabrous shrubs; leaves alternate, sub-opposite, or opposite; inflorescence a short axillary panicle; bracts solitary, minute.

Species 9, spread through southern Europe, India, and the whole of Africa; 1 species in South Africa, extending from the Cape to Natal and the Transvaal; also in several of the central districts. There is some doubt as to whether the Transvaal plant is the same species as the Cape plant.

2104

2. RHOIICARPUS A.DC.

Flowers bisexual. *Perianth* 5-lobed; tube slender, obconic; segments ovate, acute, persistent, with a tuft of hairs attached to the anthers. *Stamens* 5, with slender filaments; anthers 2-theecous. *Disc* sub-concave, with short prominent obtuse lobes. *Ovary* fleshy, with 5 ovules hanging from the apex of the straight cylindric placenta; style cylindric-conical; stigmas 5, minute. *Fruit* a red drupe, crowned with the persistent perianth-segments. *Seed* solitary.

A shrub ; branches stiff, 4-angled ; younger branches almost winged ; leaves opposite, sessile, with a prominent midrib ; inflorescence a short axillary or terminal raceme or panicle composed of 3-flowered axillary cymules ; bracts persistent, small, leaf-like, partly adnate to the peduncles.

Endemic ; species 1, extending from Mossel Bay to British Kaffraria.

2116

3. OSYRIDICARPUS, A.DC.

Flowers bisexual. *Perianth* 5-lobed, adnate to the ovary below ; tube cylindric ; segments with a tuft of hairs on the face attached to the back of the anther, valvate in bud. *Stamens* 5, inserted below the segments. *Disc* indistinct. *Ovary* with 2-3 pendulous ovules from the tip of a flexuous filiform central placenta ; stigma obscurely lobed. *Fruit* a drupe, globose, crowned with the persistent perianth.

Undershubs, with long slender branchlets ; leaves alternate, shortly petioled, oblong or lanceolate, 3-nerved ; inflorescence a terminal raceme, produced down into the axils of the leaves ; bracteoles minute.

An African genus of 5 species ; 1 species in South Africa, extending from Albany to Natal and into the Transvaal.

2117

4. THESIDIUM, Sond.

Plants dioecious. *Male flowers* with a salver-shaped perianth. *Perianth-tube* slender, continuous with the solid receptacle ; segments spreading, with a bundle of hairs arising from their base and attached to the back of the anthers. *Stamens* 4, inserted at the base of the perianth-segments. *Style* rudimentary, or more often absent. *Female flowers* with an ovoid receptacle adnate to the ovary. *Perianth-tube* very shortly campanulate or scarcely evident ; segments 4, rarely 5. *Disc* usually obscure. *Staminodes* rarely present. *Ovary* with 2-3 pendulous ovules from the apex of a central straight or folded filiform placenta ; style short ; stigma obscurely 2-3-lobed. *Fruit* a nut, with a fleshy basal ring, small, globose or ovoid, crowned by the persistent perianth, 5-ribbed and conspicuously reticulated, sometimes pitted.

Low shrubs or herbs, much branched, semi-parasitic ; leaves alternate, often very small or squamiform, rigid ; flowers very small, sub-sessile, solitary, or in 2-3-flowered cymules in the axils of bracts, arranged in slender terminal spikes ; bracts and bracteoles in the male plants usually small ; in the female often conspicuous, frequently hispid or scabridulous.

Endemic ; species 7 or 8, confined to the coastal belt from Malmesbury to Port Elizabeth.

2118

5. THESIUM, Linn.

Flowers bisexual. *Perianth* 5-lobed, cup-shaped or on a tubular or turbinate receptacle enclosing the ovary ; external glands 5, usually present, alternating with the perianth-segments ; segments more or less hooded, with or without an apical beard of hairs, usually with a tuft of hairs on their face behind the anthers and adhering to the apex of the anther, when absent then a ring of hairs occurs at the throat of the perianth-tube at the level of the insertion of the filaments, with the margins hairy, papillose, fringed, or glabrous. *Stamens* 5, inserted at the base of the segments or in the perianth-tube. *Disc* often conspicuous. *Ovary* with 2-4 ovules pendulous from the apex of a slender flexuous placenta ; style cylindric or almost absent ; stigma capitate or obscurely 3-lobed. *Fruit* dry, ellipsoid, globose, or obovoid, usually 10-ribbed, with more or less conspicuous reticulations between the ribs, crowned with the persistent perianth. *Seed* similar in shape to the fruit ; endosperm fleshy.

Herbs or undershrubs, usually (if not always) semi-parasitic; leaves alternate (in the South African species), linear, linear-lanceolate, subulate or reduced to scales or spines, rarely sub-orbicular; inflorescence a loose or compact terminal or axillary raceme, spike, or panicle, frequently cymose, sometimes a small or fairly large dense head.

Species about 250, inhabiting the temperate regions or mountains of the tropical zone of the Old World; only 2 species in South America; 128 species in South Africa, widely distributed over the Union.

44. GRUBBIACEÆ.

Flowers bisexual, regular. *Perianth* simple, 4-1-lobed; segments densely pilose on the back, valvate in the bud. *Stamens* 8, in 2 whorls of 4 each. *Disc* hairy, very slightly prominent. *Ovary* inferior, 1-chambered, or at first incompletely 2-chambered, with 2 pendulous ovules from a placenta which may be free or more or less adnate to the ovary wall; style short; stigma emarginate or slightly bifid. *Fruit* a drupe, crowned with the disc and style. *Seed* ovoid; endosperm fleshy; radicle inferior.

Heath-like shrubs; leaves opposite, linear or lanceolate, entire; flowers small, ternate or in strobili in the axils of each pair of opposite leaves.

2121

1. GRUBBIA, Berg.

The only genus. Characters of the Family.

Endemic; species 4, ranging from the Cape to George; also recorded from the Uitenhage district.

45. OLACACEÆ.

Flowers bisexual, regular. *Calyx* truncate, 4-6-toothed or -lobed, sometimes absent. *Petals* 3-6, nearly always valvate in bud. *Stamens* usually as many or twice as many as the petals, hypogynous or inserted at the base of the petals; filaments flattened or filiform; anthers opening by 2 longitudinal slits. *Staminodes* sometimes present. *Ovary* superior or nearly so, rarely half-inferior, at the base or almost to the apex 3-5-chambered, sometimes the septa absent and then ovary 1-chambered, with 1-5 pendulous ovules; style simple. *Fruit* a 1-seeded drupe. *Seed* with a small embryo and abundant endosperm.

Shrubs or trees, rarely undershrubs; leaves alternate, entire; inflorescence an axillary cyme, spike, or raceme, rarely flowers solitary.

Genera 13, with almost 100 species, natives of America, Africa, Asia, and Australia.

Calyx cup-like, truncate 1. *Olax*, Linn.

Calyx 4-5-toothed or -lobed 2. *Ximenia*, Plum.

2131

1. OLAX, Linn.

Calyx small, cup-like, truncate, in the fruit enlarged and almost enclosing the drupe. *Petals* 6, rarely 5, inserted on a disc, free from the calyx, free or slightly cohering, valvate. *Stamens* with 9-12 staminodes, rarely fewer; perfect stamens commonly 3; staminodes often 6, 2-fid or 2-partite; filaments flattened, more or less adnate to the petals; perfect anthers oblong. *Ovary* superior, 1-chambered or 3-chambered at the base, with 3 ovules; style short or long; stigma sub-capitate. *Fruit* a globose or oblong drupe, almost wholly included in the calyx.

Glabrous trees, shrubs, or undershrubs, sometimes scandent; leaves alternate, often distichous, entire, articulated with the branches, sometimes very small and squamiform; inflorescence a short axillary spike or raceme; flowers small, rarely solitary.

Species about 80, natives of Australia, tropical Asia, Africa, and Madagascar; 1 species recorded from the northern Transvaal.

2136

2. XIMENIA, Plum.

Calyx small, 4-5-toothed or -lobed, unchanged in the fruit. *Petals* 4-5, hypogynous, valvate, bearded within. *Stamens* twice as many as the petals; filaments filiform; anthers linear. *Ovary* superior, 3-chambered at the base or high up, with 3 ovules; style entire; stigma sub-capitate. *Fruit* an ovoid or globose drupe.

Glabrous or tomentose shrubs or trees, with abortive spinescent branchlets; leaves alternate, entire, often fascicled; inflorescence a short axillary cyme, or rarely flowers solitary.

Species 4, natives of Africa, but 1 species found in Mexico; 2 species in South Africa, recorded from Natal and the Transvaal.

46. BALANOPHORACEÆ.

Flowers small, unisexual in the South African genera. *Male flowers* with a 3-4-lobed perianth, regular or 2-lipped; lobes valvate. *Stamens* 2-3; anthers either 2-theous and bursting by longitudinal slits, or several-theous and bursting by terminal pores. *Female flowers* with a 3 to many-lobed globose or tubular perianth, or perianth 0. *Disc* sometimes large and cushion-like. *Ovary* inferior, 1- (or at length 3-) chambered, with 1-3 pendulous ovules; style long or 0; stigma discoid or 3-lobed. *Fruit* indehiscent, separate or united into syncarpia. *Seed* with fleshy endosperm; embryo central or apical.

Herbs, parasitic on the roots of trees or shrubs, usually brightly coloured; leaves reduced and scale-like; inflorescence monœcious and simple or dicecious and much-branched; bracts present or 0.

Genera about 15; species about 50, widely distributed in tropical and sub-tropical regions.

Tribe **Sarcophyteæ**: Characters of the genus (genus 1).

Tribe **Mystropetaleæ**: Characters of the genus (genus 2).

Inflorescence much-branched, dicecious; anthers 3, many-theous, dehiscing by terminal pores; fruits united into syncarpia

2. **Sarcophyte**, *Sparrm.*

Inflorescence unbranched, monœcious, male above, female below;

anthers 2, two-theous, dehiscing by longitudinal slits; fruits separate 1. **Mystropetalon**, *Harv.*

2155

1. MYSTROPETALON, Harv.

Plants monoecious. *Male flowers* with a 2-lipped perianth; the lower lip of one segment; the upper lip of 2 segments. *Stamens* 2, inserted on the upper perianth-segments; anthers 2-theous, dehiscing longitudinally. *Female flowers* opening before the male flower, with a 3-lobed small urceolate or tubular perianth. *Staminodes* 2, very small, or 0. *Disc* thick, cushion-like. *Ovary* ovoid or elliptic, 1- or 3-chambered, with 3 pendulous ovules; style columnar; stigma discoid or 3-lobed. *Fruit* globose. *Seed* solitary; embryo small, apical.

Fleshy parasitic herbs springing from an irregular nodular rhizome; leaves scale-like, fleshy; inflorescence a dense spike, with the male flowers above

and the female flowers below : female flowers ripening before the male ; bracts and 2 bracteoles present.

Endemic ; species 3, confined to the Malmesbury and Caledon districts.

2158

2. SARCOPHYTE, Sparrm.

Plants dioecious. *Male flowers* with a 3-lobed perianth ; tube short, solid ; segments valvate. *Stamens* 3, inserted at the base of the perianth-lobes ; anthers many-theous, opening by apical pores. *Ovary* none. *Female flowers* usually united into globose heads. *Ovary* ovoid, 1-chambered, or at length 3-chambered through the protrusion of the placentas, with 1-3 pendulous ovules ; stigma sessile, discoid. *Fruit* a fleshy syncarpium. *Seed* sub-globose ; embryo central, globose.

An African genus of 2 species ; 1 in tropical and the other in South Africa, recorded from Uitenhage to the Transkei and also in the northern Transvaal.

47. ARISTOLOCHIIACEÆ.

Flowers bisexual. *Perianth* simple, variously produced above the ovary, equally or unequally 3-lobed, or tubular and variously shaped ; lobes valvate. *Stamens* 6 or many, inserted in 1 or 2 rows round the apex of the ovary or on a styler-column ; filaments free or scarcely distinguishable from the column ; anthers free or adnate to the column. *Disc* 0. *Ovary* inferior or rarely semi-superior, perfectly or imperfectly 4-6-chambered, with many anatropous horizontal or pendulous ovules in each chamber, with parietal placentas ; style columnar, with 3 or more stigmas. *Fruit* a capsule or berry, sometimes crowned with the persistent perianth. *Seeds* numerous, various ; embryo small ; endosperm copious.

Herbs, rarely shrubs, often climbing ; leaves alternate, petioled, often cordate, entire or 3-5-lobed ; stipules 0 ; flowers medium-sized or large, rarely small, usually lurid, terminal, axillary or lateral, solitary, or inflorescence a raceme or cyme ; bracts present or 0.

Genera 6, with about 200 species, chiefly tropical.

2174

1. ARISTOLOCHIA, Linn.

Perianth-tube linear-oblong or obovoid, more or less distinctly articulated above the ovary, inflated at the base, then contracted, hairy within ; limb dilated, obliquely 1-2-lipped. *Anthers* 6, rarely 4 or 10 or many ; filaments scarcely distinguishable from the column ; anthers adnate to the column. *Ovary* inferior ; style very short, 3-6-lobed. *Fruit* a capsule, opening by 6, rarely 4-5, valves.

Shrubs or perennial herbs, often climbing ; leaves petioled, entire or lobed, often cordate ; petiole dilated and often with a stipule-like leaf in the axil ; flowers axillary, solitary, fasciated, or inflorescence a short raceme ; bracts present or 0.

Species about 180, found in all warm and temperate countries ; 1 species recorded from the northern Transvaal.

48. RAFFLESIIACEÆ.

Flowers unisexual, regular. *Bracts* and bracteoles present or absent. *Perianth* 4- or more-partite. *Stamens* 8 or more ; filaments united into a column. *Ovary* inferior, 1-chambered, with 4 or more parietal placentas, or several-chambered with axile placentas and with numerous ovules ;

style simple ; stigmas situated beneath its thickened apex. *Fruit* a berry. *Seeds* minute ; testa hard ; endosperm oily ; embryo undivided.

Parasitic herbs ; leaves reduced to scales ; inflorescence a raceme, or flowers solitary.

Genera 7 ; species about 25, natives of the Malay Archipelago, South America, southern Europe, Asia, and Africa.

2180

CYTINUS, Linn.

Plants monoecious or dioecious. *Bracts* and often 2 bracteoles present. *Male flowers* with a 4-9-lobed perianth ; tube tubular-campanulate or infundibuliform. *Anthers* 8-10, connate in an exserted head, 2-theous, extrorse. *Ovary* none. *Female flowers* with the perianth almost absent. *Ovary* 1-chambered or more or less 6- or more-chambered by the projection of the parietal placentas ; style columnar ; stigma globose, grooved, with the apex obtuse or very shortly radially lobed.

Herbs, coloured, somewhat fleshy, parasitic on roots ; stems short, thick, simple, bearing alternate coloured scales ; inflorescence a simple terminal spike ; flowers single, sessile or shortly pedicellate in the axil of a bract, with 2 opposite bracteoles, or bracts 0.

Species 4, natives of the Mediterranean and Mexico ; 1 species in South Africa, extending from Malmesbury to Port Elizabeth.

49. HYDNORACEÆ.

Flowers solitary, regular, bisexual. *Perianth* 3-4- (rarely 5-) lobed, fleshy ; tube short or long ; lobes valvate. *Stamens* as many as and alternating with the perianth-lobes, inserted in the tube ; filaments united ; anther-thecae numerous, linear. *Ovary* inferior, 1-chambered, with many placentas hanging down from the top of the chamber ; stigma sessile. *Fruit* succulent. *Seed* with a hard testa ; endosperm copious ; embryo undivided.

Fleshy herbaceous leafless root-parasites, with a creeping rootstock.

Genera 2 ; species 8-9 ; 1 in America ; 2 in South Africa ; the rest in tropical Africa.

2182

HYDNORA, Thunb.

Flowers bisexual. *Perianth* fleshy, 3-5-lobed ; lobe 2-angled above, channelled or concave in the lower part inside. *Anthers* forming a flexuous lobed ring in the perianth-tube, transversely divided into numerous thecae. *Stigmas* cushion-shaped, 3-5-lobed and bearing numerous radiating lamellae. *Fruit* sub-globose, filled with gelatinous pulp. *Seeds* globose, free in the pulp ; endosperm horny.

Parasitic fungus-like plants, with a fleshy warted subterranean rhizome ; flowers large, arising singly from the rhizome, with an unpleasant odour.

Endemic ; species 2, widely distributed ; found from Little Namaqualand to King William's Town ; also in the Transvaal.

50. POLYGONACEÆ.

Flowers regular, bisexual, or unisexual with occasional bisexual flowers. *Bracts* membranous. *Perianth* 4-6-lobed ; tube short ; lobes imbricate, equal or unequal, sometimes in 2 rows. *Stamens* usually 6-9, sometimes less, inserted at the base of the perianth ; filaments free or connate at the base ; anthers 2-theous. *Disc* annular. *Ovary* superior, sessile, 3-angled or lenticular, -chambered, with a solitary basal sessile or stalked ovule ; styles 2-3, distinct ; stigmas dilated or capitate. *Fruit* an indehiscent 3-cornered

or lenticular nut. *Seed* usually similar in shape to the nut, sometimes sub-terete; endosperm abundant; embryo usually more or less excentric; cotyledons flat, narrow or broad; radical long.

Herbs or shrubs; leaves alternate, with the base of the petiole dilated into a membranous sheath; flowers small, in racemes or axillary, usually fascicled in the axils of persistent membranous bracts.

Genera about 30, with about 600 species, cosmopolitan.

Tribe **Rumiceæ**: Perianth 6-merous or rarely 4-merous; stamens 9 or 6, now and then fewer; styles short, recurved-spreading, dilated into broad horseshoe-shaped peltate or fimbriate stigmas (genera 1-2).

Tribe **Eupolygoneæ**: Perianth 5-merous, rarely 4-merous; stamens 6-8, now and then fewer; styles often filiform; stigmas capitate (genera 3-4).

1. Flowers bisexual or unisexual; perianth-segments at least in the bisexual and female flowers usually 6, in 2 rows and the inner and outer row unequal 2
 Flowers bisexual, or bisexual with occasional unisexual flowers; perianth in the bisexual flowers usually 5-lobed, usually equal, or sometimes the 3 outer rather larger but little accrescent 3
2. The 3 inner perianth-segments much enlarged in fruit; the 3 outer unchanged; inflorescence a leafy or leafless terminal panicle
 2. **Rumex**, Linn.
 The 3 inner perianth-segments obtuse or aristate; the 3 outer spiny in fruit; flowers in axillary fascicles or the upper, by the abortion of the leaves, appearing racemose 1. **Emex**, Neck.
3. Perianth-tube in bisexual flowers constricted above the ovary; in the male almost obsolete; pedicels not articulated
 4. **Oxygonum**, Burch.
 Perianth-tube not constricted above the ovary; pedicels articulated
 3. **Polygonum**, Linn.

2194

1. EMEX, Neck.

Plants monoëcious. *Male flowers* pedicelled, with 5-6 equal perianth-segments. *Stamens* 4-6. *Female flowers* sessile, with a 6-lobed perianth enlarged and hardened in the fruit; tube ovoid, in fruit 3- or 6-angled, more or less transversely ribbed between the angles; lobes in 2 series; the outer lobes spiny in the fruit; the inner lobes obtuse or aristate. *Ovary* included in the perianth-tube, 3-angled; styles 3, short; stigmas dilated. *Fruit* enclosed, but free within the perianth-tube, 3-angled. *Seed* sub-terete.

Rigid herbs; leaves alternate, petioled; ochreae more or less membranous, quickly splitting up or falling off; flowers in axillary fascicles, or the upper, by the abortion of the leaves, appearing racemose.

Species 2, one of which occurs in South Africa and Australia and the other in the Mediterranean region. In the Union the species is widely distributed.

2195

2. RUMEX, Linn.

Flowers bisexual or unisexual. *Bracts* 0. *Perianth-segments* usually 6; the inner much enlarged in the fruit; the 3 outer unchanged. *Stamens* 6, inserted at the base of the perianth. *Ovary* 3-angled; styles 3; stigmas fimbriate. *Fruit* 3-angled, included in the persistent inner perianth-segments. *Seed* similar in shape to the fruit.

Herbs, more rarely shrubs; leaves alternate, often cordate or hastate; ochreae membranous; inflorescence a leafy or leafless terminal panicle; flowers in whorls; pedicels articulated.

Species about 100, cosmopolitan, but most numerous in the temperate regions; 19 species in South Africa, several of which have been introduced; widely distributed.

2201

3. POLYGONUM, Linn.

Flowers bisexual, very rarely occasionally unisexual. *Bracts* membranous. *Perianth* 5- (rarely 4-) lobed or partite, persistent; segments equal, or the 3 outer rather larger, but little accrescent. *Stamens* usually 8, inserted near the base of the perianth; anthers with the 2 thecae united only by a short connective. *Ovary* 3-angled with 3 styles, or lenticular with 2 styles; stigmas capitate, usually entire. *Fruit* a trigonous or lenticular nut enclosed in the persistent perianth. *Seed* similar in shape to the nut.

Herbs or shrubs, erect, prostrate, or scandent; leaves alternate; ochreæ membranous, clasping the stem, often fringed with bristles; inflorescence often a terminal raceme, spike, or panicle, or the flowers fascicled in the axils of the bracts; pedicels articulated.

Species about 150, cosmopolitan; 18 species in South Africa, widely distributed over the Union.

2204

4. OXYGONUM, Burch.

Flowers bisexual, with occasional unisexual flowers. *Bracts* present. *Perianth* 5-lobed; tube in the bisexual flowers constricted above the ovary, enlarged in the fruit and hardened, often with wings or spines on the three angles, enclosing the nut; in the male flowers almost obsolete; lobes withering without falling. *Stamens* 8, inserted on the perianth. *Ovary* included in the perianth-tube; styles 3, connate at the base; stigmas capitate. *Seed* erect, turbinate, 3-angled.

Annual or perennial herbs; leaves alternate, petioled, entire or pinnatifid; ochreæ membranous, truncate; inflorescence a long lax raceme, with the flowers fascicled in the axils of the bracts.

Species about 11, a few in tropical Africa and Arabia; 7 species in South Africa, recorded from S.W. Africa, Griqualand West, Natal and the Transvaal.

51. CHENOPODIACEÆ.

Plants sometimes monœcious or diœcious. *Flowers* bisexual or unisexual, usually regular. *Bracts* and *bracteoles* present or none, sometimes enlarged in the fruit. *Perianth* 3-5-lobed or absent from the female flowers, unchanged, or enlarged in the fruit, sometimes with a horn or spine at the back, or winged. *Stamens* as many as the perianth-lobes and opposite to them, or fewer, hypogynous or perigynous, usually without staminodes; filaments usually free, rarely connate at the base; anthers 2-thealous, with the connective sometimes produced at the apex. *Disc* none, or rarely present and annular. *Ovary* superior, sometimes immersed in the base of the perianth, 1-chambered, with a single erect ovule on a short funicle or suspended from a long basal funicle; style short or long, or 0; stigmas 2-5, free or connate at the base. *Fruit* usually an indehiscent utricle, enclosed in and falling off with the perianth. *Seed* erect or horizontal, lenticular, sub-globose, or reniform; embryo annular or spiral, surrounding the floury or fleshy endosperm (absent in *Salicornia*).

Annual or perennial herbs or shrubs, rarely small trees, glabrous, farinose, lepidote, or hairy, sometimes fleshy; stems continuous or jointed, erect or decumbent; leaves alternate, rarely opposite, flat or cylindric, usually entire; stipules 0; inflorescence various, often of clusters arranged in spikes or panicles, sometimes dichotomously cymose, or flowers solitary and axillary.

Genera about 60, with about 520 species, cosmopolitan; many are weeds of cultivation.

Tribe **Euchenopodiæ**: Flowers bisexual or unisexual, with the perianth uniform in shape; seed erect, inverted, or horizontal; embryo annular or surrounding copious endosperm (genera 1-2).

Tribe **Atriplicæ**: Flowers unisexual, sometimes a few bisexual, with the perianth irregular in shape; male 3-5-lobed or -partite, without bracts; female very often with 2 bracteoles enlarged in the fruit, without a perianth; seeds erect or horizontal; embryo annular, surrounding copious endosperm (genera 3-4).

Tribe **Chenoleæ**: Flowers often bisexual and female, with the perianth uniform in shape; fruit included in the very often enlarged or appendiculate perianth; seed horizontal, very rarely erect or inverted; embryo annular, surrounding the endosperm (genera 5-6).

Tribe **Salicorniæ**: Flowers bisexual; fruit enclosed in the perianth; seed erect, inverted, or horizontal; embryo dorsal, virgulate, with the endosperm scanty or copious, or the embryo conduplicate and endosperm 0 (genus 7-8).

Tribe **Suaedeæ**: Flowers bisexual or unisexual, bracteate and with 2 bracteoles; fruit enclosed in the perianth; seed erect, inverted, or horizontal; embryo spiral (genus 9).

Tribe **Salsolæ**: Flowers bisexual or unisexual, bracteate and with 2 bracteoles; fruit enclosed in the perianth which is very often horizontally winged; seed erect, inverted, or horizontal; embryo spiral (genus 10).

1. Plants with fleshy opposite articulated branches; stamens 1-2 . . . 2
Herbs or woody shrubs . . . 3
2. Flowers hidden in the axils of bracts . . . 7. *Halopeplis*, Bunge
Flowers immersed in cavities on the flowering branches 8. *Salicornia*, Linn.
3. Leaves ternate . . . 9. *Suaeda*, Forsk.
Leaves alternate, rarely opposite or sub-opposite . . . 4
4. Perianth-segments with a spine or horn on the back, or horizontally winged (at least in fruit) . . . 5
Perianth-segments not winged nor with a spine or horn . . . 7
5. Perianth-segments silky (in the South Africa species) with a short spine at the back . . . 5. *Chenolea*, Thunb.
Perianth-segments with a horizontal wing . . . 6
6. Flowers bisexual, or female by abortion; perianth 4-5-lobed; bracts and bracteoles 0 . . . 6. *Kochia*, Roth
Flowers bisexual perianth 3-4-lobed; bracteoles 2 . . . 10. *Salsola*, Linn.
7. Bracts or bracteoles 2 in the bisexual or female flowers . . . 8
Bracts and bracteoles 0 . . . 9
8. Flowers bisexual and male; bracts of bisexual flowers narrowed at the base, slightly enlarged in the fruit . . . 3. *Exomis*, Fenzl
Plants monoecious or dioecious; bracteoles of female flower dilated at the base and much enlarged in fruit . . . 4. *Atriplex*, Linn.
9. Perianth unchanged in fruit; stigmas usually free, rarely connate below . . . 1. *Chenopodium*, Linn.
Perianth enlarged in fruit and almost closed at the mouth; stigmas connate at the base . . . 2. *Roubieva*, Moq.

2223

1. CHENOPODIUM, Linn.

Flowers bisexual. *Bracts* and bracteoles 0. *Perianth* 5- (very rarely 1-3- or 4-) lobed; lobes sometimes keeled but not appendaged, unchanged in fruit. *Stamens* 5 or fewer, hypogynous or sub-perigynous; filaments sometimes connate at the base. *Disc* none or annular. *Ovary* usually depressed-globose, with a sub-sessile ovule; style usually absent; stigmas 2-5, free, rarely connate below. *Fruit* ovoid and erect, or globose and depressed, membranous or rather fleshy. *Seed* usually horizontal; embryo annular or nearly so, surrounding copious floury endosperm.

Herbs, rarely woody at the base, annual or perennial, often glandular-pubescent, rarely glabrous; leaves alternate, linear to deltoid, entire to pinatifid; flowers minute, in globose clusters which are solitary and axillary, or inflorescence a terminal spike or raceme.

Species about 50, found chiefly in temperate regions, rare in the tropics; 10 species in South Africa, probably all introduced, and widely distributed over the Union.

2223a

2. ROUBIEVA, Moq.

Flowers minute, bisexual, or by abortion female. *Bracts* and bracteoles 0. *Perianth* urceolate, shortly 5-lobed, almost closed at the mouth in fruit; lobes rounded, enlarged in fruit. *Stamens* 5. *Disc* 0. *Ovary* globose, with a sub-sessile ovule; stigmas 2-5, connate at the base. *Fruit* sub-globose or oblong, enclosed in the enlarged perianth; thinly membranous. *Seed* erect, orbicular, slightly compressed.

Branched glandular-puberulous herbs; leaves small, alternate, sub-sessile, sinuate-dentate or sub-pinnatifid; fruits stalked, sub-vericillate.

Species 2, found in tropical and temperate America. A single species (introduced) in South Africa, recorded from the Cape, Albany, and the Transvaal.

2226

3. EXOMIS, Fenzl

Flowers male and bisexual. *Male flowers* without bracts. *Perianth-segments* 5. *Stamens* 5. *Bisexual flowers* with 2 bracts. *Perianth-segments* 3-5, sometimes 0, very minute, slightly united below. *Staminodes* 0. *Styles* 2, united below. *Fruit* fleshy, sometimes enclosed in the enlarged bracts.

An ashy grey shrub; leaves alternate, entire; inflorescence a terminal spike, or flowers in axillary clusters.

Endemic; species 1, found from the Cape to Albany; also in Griqualand West, Calvinia, and the Orange Free State.

2229

4. ATRIPLEX, Linn.

Plants monoecious or dioecious. *Male flowers* without bracts or bracteoles. *Perianth* 3-5-partite. *Stamens* 3-5, inserted at the base of the perianth; filaments free or connate at the base. *Ovary* none, or conical and rudimentary. *Female flowers* with 2 bracteoles; bracteoles enlarged in fruit, dilated at the base and connate into a 2-lipped cup, rarely quite separate. *Perianth* none. *Disc* and *staminodes* rudimentary. *Ovary* ovoid or depressed globose, with the ovule erect on a short funicle or suspended from the apex of a long basal funicle; stigmas 2, connate at the base. *Fruit* enclosed in the much enlarged bracteoles, membranous.

Herbs or shrubs, more or less furfuraceous or covered with lepidote scales; leaves alternate, rarely opposite, sessile or stalked; flowers in glomerules; glomerules either axillary and sessile, or collected into spikes or panicles.

Species about 100, found in the temperate and tropical regions of the whole world; 11 species in South Africa, most of them either introduced or cosmopolitan, widely distributed over the Union.

2238

5. CHENOLEA, Thunb.

Flowers bisexual and female. *Bracts* and bracteoles 0. *Perianth* 5-lobed; tube turbinate, globose, or orbicular-depressed, villous or tomentose, rarely glabrous; lobes incurved, enlarged in fruit, produced into spines or horns on the back, rarely unarmed. *Stamens* 5. *Disc* 0. *Ovary* ovoid, attenuated into a long or short style, with a sub-sessile ovule; stigmas 2-3. *Fruit* enclosed in the crustaceous or coriaceous perianth. *Seed* orbicular.

Herbs or shrubs, erect or decumbent, usually hairy; leaves alternate, sessile, linear, lanceolate, or terete, entire; flowers axillary, minute, solitary or clustered.

Species 3, 2 in north Africa and Arabia; 1 species in South Africa, extending from the Cape to Natal; also recorded from Cradock and Bechuanaland.

2240

6. KOCHIA, Roth

Flowers bisexual and female. *Bracts* and bracteoles 0. *Perianth* 5-lobed ; tube sub-globose to urceolate, horizontally winged on the back ; lobes incurved. *Stamens* 5. *Disc* 0. *Ovary* ovoid, attenuated into a slender style, with a sub-sessile ovule ; stigmas 2-3. *Fruit* depressed-globose. *Seed* orbicular.

Herbs or shrubs, hairy, rarely glabrous ; leaves alternate, rarely sub-opposite, sessile, linear to oblong, flat or terete, sometimes minute, entire ; flowers axillary, small, sessile, solitary or clustered.

Species about 30, found in Central Europe, temperate Asia, north Africa, and Australia. A single species is found in South Africa, recorded from Albany, Graaff-Reinet, and the Karroo region.

2249

7. HALOPEPLIS, Bunge

Flowers bisexual, in groups of 3 in the axils of scales of the strobilus, connate and adnate to the walls of the flower-bearing area. *Perianth* 4-angled, compressed, 3-toothed. *Stamens* 1-2 ; filaments very short. *Ovary* pear-shaped, sub-compressed, with the ovule suspended from the apex of the funicle ; stigmas 2. *Fruit* obovoid, compressed, attenuated at the apex, membranous. *Seed* minute, smooth or papillose.

Annual or perennial herbs, with articulated stems ; leaves opposite or the upper scattered, very short, fleshy, sub-globose or ovoid ; flowering spikes alternate, erect-spreading ; bracts spirally placed, sub-orbicular, persistent.

Species 3, natives of the Mediterranean Region and Central Asia ; 1 species recorded from the Cape Peninsula.

2257

8. SALICORNIA, Linn.

Flowers bisexual, or occasionally a few unisexual, immersed in clusters of 3-7 in hollows at the articulations of the branches, free or connate. *Perianth* fleshy, 3-4-toothed. *Stamens* 2, rarely 1. *Ovary* ovoid, attenuated at the apex, with a sub-sessile ovule ; style lacerated at the apex, or with 2 subulate stigmas. *Fruit* ovoid or oblong, enclosed in the perianth. *Seed* compressed, hairy.

Herbs, with much reduced leaves, or fleshy, erect to decumbent ; branches opposite, articulated ; groups of flowers in short or long terminal cylindric spikes.

A genus of 9 species, widely spread on sea coasts : 3 species in South Africa, found from the Cape to Natal.

2261

9. SUÆDA, Forsk.

Flowers bisexual, or unisexual by abortion, minute. *Bracts* present ; bracteoles 2. *Perianth* 5-lobed or -partite ; tube globose, turbinate, or urceolate ; lobes or segments equal or unequal, rarely all shortly winged. *Stamens* 5. *Disc* present or 0. *Ovary* broadly sessile at the base or adnate to the perianth-tube, with a sub-sessile ovule ; stigmas 2-5. *Fruit* enclosed in the perianth. *Seed* various.

Herbs or shrubs, erect or prostrate ; leaves in whorls of 3, fleshy, terete or semi-terete, rarely spatulate or flat, entire ; flowers solitary or in clusters, with the clusters at length adnate to the base of the leaves.

Species about 40, found on seashores throughout the world ; 2 species in South Africa, extending from Namaqualand to Uitenhage.

2269

10. SALSOLA, Linn.

Flowers bisexual, axillary. *Bracteoles* 2. *Perianth* 5-, rarely 4-, partite, in fruit with a broad horizontal wing above the middle. *Stamens* 5 or fewer. *Ovary* globose-depressed or broadly ovoid, narrowed into a short or long style, with a sub-sessile ovule or ovule suspended from the apex of an elongated funicle; stigmas 2, rarely 3. *Fruit* enclosed in the perianth.

Herbs, shrubs, or sub-shrubs, of various habit; leaves alternate, rarely opposite, sessile or broadly amplexicaul at the base, with the apex often pungent; flowers solitary or fascicled.

Species about 40, found chiefly in temperate Asia, north and tropical Africa, North and South America, 1 species in Australia; 4 species in South Africa, chiefly in the central regions, but also recorded from Little Namaqualand, Griqualand West, the Orange Free State, and the Transvaal.

52. AMARANTACEÆ.

Flowers bisexual, rarely unisexual, many of them rudimentary or obsolete. *Perianth-segments* usually 5 (less commonly 3 or 4 or 1), usually united near the base, equal or unequal, much imbricated. *Stamens* hypogynous 5 (rarely 3, 4 or 1), opposite the perianth-segments; filaments united at the base into a cup or tube, very rarely free to the base; staminodes usually present, alternating with the stamens, often fimbriate, toothed, lacinate, long or short, or nearly obsolete, more rarely staminodes 0; anthers usually 2-theous, more rarely 1-theous. *Ovary* superior, 1-chambered, with usually a solitary ovule (rarely 2 or more), erect or suspended from the apex of a long or short basal funicle; style long or short, or sometimes 0; stigma usually 1, sometimes bifid or more rarely 3-5. *Fruit* a membranous utricle (rarely a berry), irregularly breaking up, or circumscissile, often enclosed in the perianth. *Seed* lenticular, oblong or orbicular-reniform, compressed or rarely winged; embryo annular, surrounding copious endosperm.

Herbs or undershrubs (rarely trees), usually erect, seldom scandent; leaves simple, entire, opposite or alternate; inflorescence a spike, head, or rarely a raceme; flowers small and minute; bracts and bracteoles usually hyaline, sometimes coriaceous, membranous or spinescent.

Genera about 50; species about 600. In tropical and warm climates.

Tribe *Celosieæ*: Anthers 2-theous; ovules 2 to many; leaves alternate (genera 1-2).

Tribe *Amaranteæ*: Anthers 2-theous; ovules solitary (genera 3-16).

Tribe *Gomphreneæ*: Anthers 1-theous; ovules solitary (genera 17-19).

- | | |
|--|---|
| 1. Stigmas 2 or 3, rarely 4 or 5 | 2 |
| Stigma 1, sometimes bifid | 6 |
| 2. Ovary with 2 or more ovules | 3 |
| Ovary with a single ovule | 4 |
| 3. Filaments united at the base; staminodes none or very short | |

1. *Celosia*, Linn.

Filaments united high up; staminodes longer than the filaments

2. *Hermbstædia*, Reichb.

- | | |
|---------------------|---|
| 4. Leaves alternate | 5 |
|---------------------|---|

Leaves opposite

19. *Gomphrena*, Linn.

- | | |
|-------------------------------|-----------------------------|
| 5. Perianth-segments glabrous | 3. <i>Amarantus</i> , Linn. |
|-------------------------------|-----------------------------|

Perianth-segments woolly

12. *Aerva*, Forsk.

- | | |
|--|---|
| 6. Leaves (at least in the South African species) alternate, scattered, rarely sub-whorled, sometimes alternate and opposite on the same plant then the perianth-segments woolly | 7 |
|--|---|

Leaves opposite

10

7. Ovary woolly or tomentose 4. *Sericocoma*, Fenzl
Ovary glabrous 8
8. Perfect flower or flowers surrounded by a fascicle of recurved spines
united into a stalk below (representing sterile flowers)
5. *Sericorema*, Lopr. 9
Flowers not surrounded by spines 9
9. Woolly herbs or undershrubs; leaves flat 12. *Aerva*, Forsk.
Rigid branched shrub, younger branches tomentose; leaves cylindric,
fleshy 14. *Calicorema*, Hook.f. 12
10. Ovary densely hairy 11
Ovary glabrous 12
11. Perfect flower or flowers surrounded by spines (representing sterile
flowers); flower-clusters in dense spikes 6. *Marcellia*, Baill.
Flowers not surrounded by spines; flower-clusters in globose heads
10. *Leucosphæra*, Gilg 13
12. Perfect flower or flowers surrounded by straight or hooked spines
(representing sterile flowers) 13
Flowers not surrounded by spines 16
13. Ovary with a distinct horn 7. *Cyphocarpa*, Lopr. 14
Ovary without a horn 14
14. Spines simple; stigma obliquely truncate or shortly 2-fid
8. *Centema*, Hook.f. 15
Spines hooked; stigma capitate 15
15. Spines arranged in stellate bunches; staminodes none 11. *Pupalia*, Juss.
Spines not in stellate bunches; staminodes lacerated or linear
9. *Cyathula*, Lour. 17
16. Bracts and bracteoles small and hyaline; staminodes none; perianth-
segments often villous 13. *Psilotrichum*, Blume
Bracteoles and (or) bracts spinescent, membranous or coriaceous;
staminodes present 17
17. Bracts and bracteoles spinescent; staminodes toothed, or with a
toothed scale at the back 15. *Achyranthes*, Linn.
Bracts and bracteoles membranous or coriaceous, if pungent then
anthers 1-theous; staminodes entire, fimbriate, or laciniate 18
18. Anthers 2-theous 16. *Achyropsis*, Hook.f. 19
Anthers 1-theous 19
19. Staminodes a little longer than the filaments, laciniate at the apex
18. *Telanthera*, R.Br.
Staminodes longer or shorter than the filaments, entire at the apex
17. *Alternanthera*, Forsk.

2292

1. CELOSIA, Linn.

Flowers bisexual. *Bracts* and 2 bracteoles present. *Perianth* scarious, 5-partite; segments oblong or lanceolate, obtuse or acute, erect in fruit. *Stamens* 5; filaments united at the base into a membranous cup; anthers 2-theous. *Ovary* ovoid or sub-globose, with 2 or more ovules on elongated basal stalks; style short, or long, or 0; stigmas 2-3, subulate. *Fruit* ovoid or oblong, membranous, circumscissile. *Seeds* 2 or more, usually erect, lenticular, black, smooth, polished.

Herbs or undershrubs, erect or rambling; leaves alternate, attenuated into the petiole, simple or rarely lobed; inflorescence of dense terminal and axillary spikes, or the flowers fasciculate along the floriferous branchlets; flowers sessile or shortly pedicellate, white, silvery, or rosy.

Species about 40, found in the warmer regions of the globe; 1 species in South Africa, extending from Pondoland to Natal and the Transvaal, but is also found in tropical Africa and Madagascar.

2293

2. HERMBSTÆDTIA, Reichb.

Flowers bisexual. *Bracts* 1; bracteoles 2, small. *Perianth* scarious, 5-fid; segments sub-equal. *Fertile stamens* 5; staminodes developed as

processes alternating with and distinct from the fertile filaments, sometimes fused partially or wholly with them; anthers 2-theous. *Ovary* ovoid, attenuated into a short or sub-elongate style, with numerous ovules; stigmas 3 (rarely 2, 4 or 5). *Fruit* included in the perianth, ovoid, circumscissile. *Seeds* few or many, erect, lenticular, black, shining.

Herbs or undershrubs; leaves scattered, linear or spatulate-oblong, entire; inflorescence an elongated terminal spike (rarely a head); flowers white or rosy.

An African genus of about 17 species; 7 species in South Africa, found in Namaqualand, Griqualand West, Bechuanaland, the Orange Free State, the Transvaal and Natal.

2299

3. AMARANTUS, Linn.

Flowers unisexual, or bisexual with occasional unisexual flowers. *Bract* 1; bracteoles 2. *Perianth* membranous; segments 5 (less commonly 1-3), equal or sub-equal. *Stamens* usually 5 (rarely 1-3); filaments free at the base; staminodes 0; anthers 2-theous. *Ovary* ellipsoid, compressed, with a single sub-sessile erect ovule; style short or 0; stigmas 2-3, subulate or filiform. *Fruit* usually enclosed in the perianth, orbicular or ovoid, indehiscent or circumscissile, mostly membranous, simple or 2-3-toothed at the apex. *Seed* erect, globose, compressed, smooth and shining.

Annuals, erect or decumbent; leaves alternate, mostly simple, usually entire, petiolate; inflorescence a dense axillary head or a terminal paniculate spike; flowers white, green, rosy, or purplish.

Species about 25, common weeds in all the warmer parts of the world; 6 species recorded from South Africa, all introduced and widely spread over the Union.

2305

4. SERICOCOMA, Fenzl

Perfect flowers 1-2, with 1 or more sterile flowers usually reduced to spines. *Bracts* 1; bracteoles 2. *Perianth-segments* 5, thickly coriaceous or chartaceous, connate at the base, ovate or oblong-lanceolate; the inner the narrowest. *Stamens* 5; filaments united at the base into a short cup; staminodes usually on the rim of the cup between the stamens, rarely 0; anthers 2-theous. *Ovary* ovoid or oblong, woolly or tomentose, with a single ovule suspended from the apex of an elongate funicle; style about as long as the ovary; stigma capitate. *Fruit* included in the perianth, membranous, indehiscent. *Seed* oblong or sub-orbicular, compressed.

Herbs or undershrubs of various habit; leaves linear or oblong (rarely obovate), sessile, entire, alternate, or alternate and opposite on the same plant; inflorescence a terminal head or spike.

An African genus of about 6 species; 2 in South Africa, found in Little Namaqualand, Calvinia, Griqualand West, Prince Albert, and Graaff-Reinet.

2307

5. SERICOREMA, Lopr.

Perfect flowers 1-3, sessile and distant along the rachis, supported by 2 sterile flowers represented by a fascicle of recurved spines united into a stalk below. *Bracteoles* each enclosing a tuft of woolly hairs which cover the spines and which are enlarged in fruit so as almost to envelop the flower. *Perianth* of 5 segments, connate at the base; segments acuminate or pungent. *Stamens* 5, membranous at the base; anthers 2-theous. *Ovary* ovoid, with a single erect ovule; style scarcely any; stigma with a tuft of hairs. *Seed* doubled over on itself, somewhat horseshoe-shaped, compressed, red, glabrous.

Erect herbs ; leaves scattered, alternate and fasciculate, linear or oblong, sessile, quite entire ; inflorescence a long and lax spike.

Species 2 ; 1 in tropical Africa ; 1 in South Africa, recorded from Murraysburg, Griqualand West, the Orange Free State and the Transvaal.

2308

6. MARCELLIA, Baill.

Perfect flowers 1-3 in each cluster ; sterile flowers 1 or more in each cluster, reduced to spines, not hooked. *Perianth-segments* oblong. *Stamens* 5 ; filaments united below ; staminodes 0 ; anthers 2-theous ; *Ovary* ovoid, densely hairy, with a solitary ovule suspended from a basal funicle ; style columnar ; stigma small.

Undershrubs ; leaves opposite, simple, entire ; inflorescence a dense spike of flower-clusters near the tops of the stems.

A tropical African genus of about 9 species ; 1 species found in South-West Africa and extends into tropical Africa.

2309

7. CYPHOCARPA, Lopr.

Perfect flowers 1-4, with 1-2 sterile flowers reduced to spines and full of fine hairs. *Perianth-segments* 5, oblong or oblong-lanceolate, sub-equal or the outer the longer. *Stamens* 5 ; filaments united into a cup at the base ; staminodes on the edge of the filament-cup, alternating with the stamens ; anthers 2-theous. *Ovary* ovoid or obovoid, with a distinct horn on one side below its apex, with a solitary ovule suspended from a basal funicle ; style about half as long as the ovary ; stigma capitate. *Seed* sub-orbicular, more or less compressed.

Herbs or shrubs of various habit ; leaves opposite, linear or oblong, simple, entire, sessile or shortly petiolate ; inflorescence a spike, consisting of clusters of perfect and sterile flowers.

An African genus of about 8 species ; 4 species in South Africa, recorded from Natal and the Transvaal ; also recorded from Griqualand West.

2311

8. CENTEMA, Hook. f.

Fertile flowers 1-2, with 1 or more sterile flowers reduced to strong simple spines thickened at the base. *Bracts* persistent ; bracteoles 2. *Perianth-segments* 5, coriaceous or chartaceous, connate and thickened at the base, 3-5-nerved ; the inner the narrower. *Stamens* 5 ; filaments connected at the base by a membrane ; staminodes alternating with the stamens, very rarely staminodes 0 ; anthers 2-theous. *Ovary* ovoid, attenuated into a slender style, with a single erect ovule suspended from an elongated funicle ; stigma obliquely truncate or shortly 2-fid. *Fruit* included in the perianth, membranous, indehiscent. *Seed* orbicular or oblong, compressed.

Erect herbs or undershrubs ; leaves opposite, sessile or shortly petiolate, linear or linear-oblong, entire ; inflorescence a spike of flower-clusters.

An African genus of 7 species ; 2 in South Africa, found in the northern Transvaal and at Delagoa Bay.

2312

9. CYATHULA, Lour.

Fertile flowers 1-2, surrounded by sterile flowers whose perianth-segments are ultimately converted into rigid hooked spines. *Bracts* ovate, usually aristate ; bracteoles 2. *Perianth-segments* 5, scarious, sub-equal or the 3 inner narrower. *Stamens* 5 ; filaments united at the base by a membrane with lacerated margins, or linear staminodes alternating with the stamens ; anthers 2-theous. *Ovary* obovoid, with a single ovule suspended from an elongated basal funicle ; style filiform ; stigma capitate. *Fruit* closely enclosed in the perianth, membranous, indehiscent. *Seed* oblong.

Herbs, sometimes shrubby at the base ; leaves opposite, petiolate, ovate, acuminate, quite entire ; inflorescence a spike or capitate cluster.

Species about 15, natives of the warmer parts of Asia, Africa, and South America ; 6 species in South Africa, recorded from Albany to Natal, the Orange Free State and the Transvaal ; also found in Graaff-Reinet and Aliwal North.

2313 10. LEUCOSPHERA, Gilg (partly).

Perfect flowers in 2-flowered clusters arranged in globose heads ; barren flowers none. *Perianth-segments* 5, clothed with white silky hairs. *Stamens* 5 ; staminodes none. *Ovary* elongate. Otherwise as in *Marcellia*, Baill.

Species 1, known only from the Bredasdorp district.

2314 11. PUPALIA, Juss.

Fertile flower 1, central, surrounded by sterile flowers reduced to stellate bunches of hooked spines. *Bracts* scarious. *Perianth* 5-partite ; segments sub-equal, acuminate, 3-5-nerved. *Stamens* 5 ; filaments very shortly connate at the base ; staminodes 0 ; anthers 2-theous. *Ovary* ovoid, tapering into a slender style, with a single ovule pendulous from a long basal funicle ; stigma capitellate. *Fruit* enclosed in the perianth, ovoid, compressed, membranous, indehiscent. *Seed* lenticular.

Herbs or undershrubs, trichotomously branched ; leaves opposite, petiolate, broad, quite entire ; inflorescence a simple or branched spike.

Species about 6, found in tropical Africa, the Mascarene Islands, and tropical Asia ; 2 species in South Africa extending from Uitenhage to Natal and the Transvaal ; also found in Griqualand West.

2317 12. AERVA, Forsk.

Flowers bisexual, or with occasional unisexual flowers, or plants dioecious. *Bracts* present ; bracteoles 2. *Perianth* usually of 5 segments ; segments equal or the 3 inner narrower ; all or the 3 inner only softly woolly. *Stamens* usually 5 ; filaments usually unequal, united at the base into a cup, with staminodes alternating with the stamens ; anthers 2-theous. *Ovary* with a single ovule suspended from an elongated basal funicle ; style short or long ; stigmas 2 or stigmas capitellate. *Fruit* membranous, enclosed in the perianth. *Seed* ovoid or reniform, compressed.

Woolly herbs or undershrubs ; leaves usually alternate, entire, flat ; inflorescence a dense cylindric terminal and axillary solitary spike, or the spikes paniculate.

Species about 10, found in the warmer parts of Asia and Africa ; 2 species in South Africa, recorded from Griqualand West, the Transvaal and Natal ; both also occur in tropical Africa.

2324 13. PSILOTRICHUM, Blume

Flowers bisexual. *Bract* 1, small, hyaline ; bracteoles 2, small, hyaline. *Perianth* chaffy, 5-partite ; segments sometimes gibbous at the base, strongly nerved, usually villous outside, glabrous within. *Stamens* 5 ; filaments unequal, united at the base into a cup ; staminodes 0 ; anthers 2-theous. *Ovary* sub-globose or oblong, with a single ovule suspended from a long basal funicle ; style slender ; stigma capitate or bifid. *Fruit* membranous, indehiscent, enclosed in the hardened base of the perianth. *Seed* lenticular.

Herbs or shrubs, trichotomously branched ; leaves opposite, ovate to elliptic-lanceolate, quite entire ; inflorescence a solitary axillary spike, head, or panicle.

Species about 20, chiefly in tropical Asia and Africa, a few in the Sandwich Islands; 2 species found in Natal, Zululand, the Transvaal, and Portuguese East Africa.

2325

14. CALICOREMA, Hook. f.

Flowers bisexual. *Bracts* hyaline, much shorter than the perianth; bracteoles 2, similar to the bracts. *Perianth* coriaceous, 5-partite; segments clothed on the back and margins with straight silky-white hairs, not longer than the segments; the 2 outer oblong-lanceolate, mucous, 3-nerved; the 3 inner narrower. *Stamens* 5, united at the base by a membranous tube, with short broad staminodes alternating with the stamens; anthers 2-theous. *Ovary* ovoid, attenuated into an elongated slender style, with a single ovule suspended from the apex of an elongated basal funicle; stigma capitellate.

A rigid branched shrub; leaves scattered, small, narrow, cylindric, fleshy, sulcate above; flowers sub-spicate arranged at the apices of the branches, solitary or fasciculate; rhachis of the inflorescence robust.

Species 1, found in Little Namaqualand and also in tropical Africa.

2328

15. ACHYRANTHES, Linn.

Flowers bisexual, deflexed when old. *Bracts* and *bracteoles* spinescent. *Perianth-segments* 4-5, aristate, becoming hard and ribbed. *Stamens* 2-5; filaments connate at the membranous base; staminodes toothed or with a toothed scale on the back; anthers 2-theous. *Ovary* oblong, slightly compressed, with a single ovule from the apex of an elongated basal funicle; style filiform; stigma capitellate.

Herbs; leaves opposite, entire, petiolate; inflorescence a slender simple spike, or spikes paniced.

Species about 15, found in the warm parts of the Old World; 2 species in South Africa, widely distributed.

2328a

16. ACHYROPSIS, Hook. fil.

Flowers bisexual. *Bracts* membranous; bracteoles 2. *Perianth* 4-5-partite, not becoming hardened at the base; segments oblong, sub-acute, shining. *Stamens* 4-5; filaments connected by a basal membrane; staminodes quadrate, sometimes fimbriate; anthers 2-theous. *Ovary* ovoid or oblong, compressed, narrowed into the style, with a single ovule suspended from the apex of a long basal funicle; stigma capitellate. *Fruit* membranous, indehiscent, enclosed by the perianth. *Seed* ovoid or lenticular.

Erect trichotomously branched undershrubs; leaves opposite or fascicled, narrow, quite entire; inflorescence an axillary spike or terminal panicle.

An African genus of 2 species; both found in South Africa from Uitenhage to Natal and the Transvaal; one extends into tropical Africa.

2335

17. ALTERNANTHERA, Forsk.

Flowers bisexual. *Bracts* present; bracteoles 2. *Perianth-segments* 5, unequal; the 2 innermost concave. *Stamens* 2-5; filaments connate at the base; staminodes long or short; anthers 1-theous. *Ovary* obovoid or orbiculate, with a solitary ovule suspended from the apex of a long basal funicle; style very short; stigma capitellate. *Fruit* compressed, sometimes with thickened or winged margins.

Herbaceous or slightly woody; leaves opposite; flowers in axillary often clustered heads.

Species about 16, found chiefly in Australia and tropical America and 3 species in tropical Africa; 2 species, both introduced, occur in South Africa from Griqualand West to the Transvaal, Natal and south to Uitenhage.

2335a

18. TELANTHERA, R. Br.

Flowers bisexual. *Bract* 1, coriaceous ; bracteoles 2, coriaceous. *Perianth-segments* 5, equal or unequal, glabrous or villous. *Stamens* 5 ; filaments united into a tube below ; staminodes long, ligulate, laciniate at the apex ; anthers 1-theous. *Ovary* globose or ovoid, with a single ovule suspended from the apex of a long basal funicle ; style short ; stigma capitate. *Fruit* obovoid, enclosed by the persistent perianth. *Seed* lenticular or oblong.

Erect or decumbent herbs or undershrubs, usually much-branched and hairy ; leaves opposite ; flowers in terminal or axillary clusters.

Species about 50, found chiefly on the shores of South America ; one species recorded from South Africa without precise locality.

2338

19. GOMPHRENA, Linn.

Flowers bisexual. *Bracts* present ; bracteoles 2, concave, keeled or winged on the back or crested. *Perianth* 5-partite or 5-fid, usually woolly at the base ; segments unequal or equal. *Filaments* united into a tube ; staminal-tube included or exserted, with 5 emarginate or bifid lobes at the top ; staminodes usually absent ; anthers 1-theous. *Ovary* turbinate or sub-globose, with a solitary ovule suspended from the apex of a basal funicle ; style short or long ; stigmas 2, rarely 3. *Fruit* ovoid or oblong, compressed. *Seed* lenticular, smooth.

Erect or prostrate branched herbs, usually thickened at the nodes, hairy ; leaves opposite, sessile or sub-sessile, quite entire ; flowers in heads (rarely spikes), naked or involucre, often solitary and sessile at the top of the branches.

Species about 90, natives of Central and South America. A single species, which occurs as a cosmopolitan weed, is found widely distributed in South Africa.

53. NYCTAGINACEÆ.

Flowers bisexual (rarely unisexual) regular, sometimes dimorphous. *Bracts* free or connate into an involucre, often brightly coloured. *Perianth* monophyllous, small, herbaceous or petaloid, persistent, often accrescent, 3-5-lobed or-toothed, sometimes circumscissile above the base. *Stamens* 1-30, usually unequal ; filaments free or connate into a cup at the base ; anthers 2-theous, dorsifixed, included or exserted. *Ovary* superior, 1-chambered, with a solitary erect ovule ; style filiform ; stigma small, simple or multifid. *Fruit* membranous, indehiscent, enclosed in the persistent base of the perianth-tube, ribbed, sulcate, or winged, sometimes glandular. *Seed* erect ; testa adhering to the fruit wall ; endosperm soft or floury ; embryo straight or curved ; radicle inferior.

Herbs, shrubs, or trees ; leaves usually opposite, entire ; stipules 0 ; inflorescence a terminal or axillary cyme, panicle, or corymb.

Genera about 23, with about 150 species, chiefly American, a few in India, the Mascarene and Pacific Islands.

Tribe **Mirabilieæ** : Fruit enclosed in the persistent base of the perianth ; embryo hooked ; cotyledons broad and convolute, or narrow and flat ; radicle elongated (genera 1-4).

Tribe **Pisonieæ** : Fruit elongated, enclosed in the persistent base of the perianth ; embryo straight ; cotyledons broad, convolute ; radicle short (genus 5).

1. Bracts united into a 5-lobed involucre ; stigma globose, with stalked papillæ 1. *Mirabilis*, Linn.
Bracts free, large or small (or none ?) ; fruit ribbed, angled, glandular, or winged 2

- | | | |
|--|---------------------------------|---|
| 2. Bracts 3, large and coloured, with a single flower attached to its mid-rib below the middle | 3. <i>Bougainvillæa</i> , Comm. | 3 |
| Bracts small (or none) | | 3 |
| 3. Perianth 4-5-lobed to the middle; fruit winged | 4. <i>Phæoptilum</i> , Radkl. | 4 |
| Perianth not lobed to the middle; fruit ribbed, angled, or glandular | | 4 |
| 4. Flowers bisexual; fruit ribbed or angled | 2. <i>Boerhaavia</i> , Linn. | |
| Flowers unisexual; fruit glandular | 5. <i>Pisonia</i> , Linn. | |

2347

1. MIRABILIS, Linn.

Flowers bisexual. *Involucre* calyx-like, 1 to many-flowered, gamophyllous, 5-lobed. *Perianth* coloured, 5-lobed; tube long, constricted above the ovary. *Stamens* 5-6, unequal, exserted; filaments incurved, united into a fleshy cup at the base. *Ovary* ellipsoid or ovoid; style exserted; stigma globose, bearing stalked papillae. *Fruit* ribbed, enclosed in the hardened base of the perianth and surrounded by the persistent staminal-cup. *Seed* filling the fruit wall to which the testa adheres; embryo curved.

Di- or tri-chotomously branched glabrous or glandular perennial herbs; root thickened, tuberous; leaves opposite, the lower petiolate, the upper sessile; involucre cymosely arranged; flowers large, white, red, yellow, or variegated.

An American genus of about 10 species; one species introduced into South Africa and recorded from Natal and the Transvaal.

2349

2. BOERHAAVIA, Linn.

Flowers bisexual. *Bracts* small, often deciduous, rarely whorled and involucrate. *Perianth* 5-lobed; tube long or short, cylindric, narrowed above the ovary; the lower part persistent and becoming hardened to enclose the fruit; the upper part petaloid and deciduous; lobes plicate. *Stamens* 1-5, more or less exserted, unequal; filaments connate below. *Ovary* shortly stalked, oblique, narrowed into the style; stigma peltate. *Fruit* 5-ribbed or 5-angled, often viscidly glandular, enclosed in the persistent lower portion of the perianth-tube. *Seed* filling the fruit, with the testa adhering to the fruit wall; embryo hooked.

Erect or diffuse herbs; leaves opposite, often in unequal pairs; inflorescence a panicle, umbel, or a head; flowers articulated with the pedicel.

Species about 30, spread throughout the tropics and warm temperate regions; 4 species in South Africa, found in the Transvaal and Natal; also in Bechuanaland, Hopetown and Queenstown.

2350

3. BOUGAINVILLÆA, Comm.

Flowers bisexual. *Bracts* 3, large, coloured, with a single flower on the mid-rib of each bract below the middle. *Perianth* 5-6-lobed; tube tubular, narrower below the middle; lobes with incurved often crisped margins. *Stamens* 7-8, unequal; filaments connate at the base. *Ovary* shortly stalked, fusiform; stigma elongated, one-sided. *Fruit* acutely five-angled, cylindric, or clavate, enclosed in the persistent lower portion of the perianth-tube. *Embryo* hooked.

Trees or shrubs, rarely scandent, unarmed or spiny; leaves alternate, petioled, entire; inflorescence solitary or fascicled, axillary or terminal.

A tropical and sub-tropical South American genus of 7-8 species. Cultivated in South Africa.

2351

4. PHÆOPTILUM, Radlk.

Plants dioecious, occasionally with a few bisexual flowers. *Bracts* small, free. *Perianth* 4- (rarely 5-) lobed to the middle; lobes ovate, spreading, petaloid. *Stamens* 8, shortly exserted; filaments connate at the base into a fleshy eup. *Ovary* stalked; style exserted; stigma penicillate. *Fruit* longitudinally 4-winged, enclosed in the hardened perianth-tube. *Seed* erect; embryo hooked.

Spinous shrubs, with grey or yellowish bark; leaves alternate or somewhat fascicled, short, narrow, linear.

An African genus of 2 species, one of which is found in South Africa, but only recorded from the Prieska and Calvinia districts.

2352

5. PISONIA, Linn.

Plants dioecious, rarely monoecious, or rarely flowers bisexual. *Bracts* 2-3, not forming an involucre. *Male flowers*: *Perianth* 5-lobed or 5-toothed; tube campanulate; lobes or teeth induplicate-valvate, erect or spreading. *Stamens* 5-10, exserted; filaments connate below into a tube or ring. *Female flowers*: *Perianth* similar to that of male, but the tube usually enlarged at the base. *Ovary* sessile, elongate, ovoid; style included or exserted; stigma capitate, peltate or lacerated. *Fruit* enclosed in the hardened perianth-base, compressed or 5-angled, with 5 viscid ribs, or 5 single or double rows of viscid stipitate glands. *Seed* with a hyaline testa adnate to the fruit wall; embryo straight.

Trees or shrubs, unarmed or with axillary spines; leaves opposite or alternate, sessile or petiolate, entire; inflorescence a sub-sessile or pedunculate panicle cyme.

Species about 30, cosmopolitan in the tropics, chiefly American, 4 species in Mauritius. A single species (also tropical African) is found in Natal.

54. PHYTOLACCACEÆ.

Flowers bisexual or unisexual. *Calyx* usually of 5-sepals, sepals more rarely 4, membranous, or with membranous or fimbriated margins. *Petals* usually 0, sometimes 3-5, or minute. *Stamens* usually 3-8, sometimes 10, sometimes many (25); filaments free or connate into a cup at the base, sometimes in bundles of 2-3; anthers 2-theous. *Ovary* superior, 1-3-chambered, sometimes 3-5-chambered and 3-5-lobed, or 6-12-chambered, or the gynæcium of 2-12 more or less free carpels, with a solitary basal ovule in each carpel or ovary-chamber; styles simple, 2-5, or as many as the carpels, sometimes decurrent on the inner face of the carpel; stigmas capitate or filiform. *Fruit* more or less membranous, dehiscent or indehiscent, more rarely fleshy, sometimes separating into 1-seeded cocci, sometimes warted or spiny, rarely winged. *Seed* sometimes granulated; embryo annular or hooked; endosperm present.

Herbs, more rarely undershrubs, rarely trees; leaves alternate, opposite, or verticillate, sometimes petioled, lax or densely covering the branches, rarely somewhat succulent; stipules small or none, or more rarely large and fimbriated; inflorescence a spike, raceme, umbel, or cyme, or flowers solitary or in fascicles; bracts usually present.

Genera 23; species about 90, natives of the Mediterranean Region, the Canary Islands, Central Asia, South America, South Africa, Australia, east and west India.

- Tribe **Rivineæ**: Perianth deeply divided or of free segments; flowers usually bisexual; ovary superior, 1-chambered, with a solitary ovule (genera 1-2).
 Tribe **Limeæ**: Perianth of free segments; flowers bisexual, rarely unisexual; ovary 2-chambered, with a solitary ovule in each chamber (genera 3-5).
 Tribe **Stegnospermeæ**: Perianth of free segments; flowers bisexual; ovary 3-5 chambered, with a solitary ovule in each chamber (genus 6).
 Tribe **Phytolacceæ**: Perianth 5-parted or segments free, more rarely of 4-6 free or deeply divided segments; gynaeceum of 5-12 free or almost free carpels, with a solitary ovule in each ovary (genera 7-8).

1. Ovary 1-2-chambered, or gynaeceum of 2 more or less free carpels . . . 2
- Ovary 3-12-chambered, or gynaeceum of 2-12 more or less free carpels . . . 6
2. Sepals 4; leaves closely packed 3. **Polpoda**, *Presl*
 Sepals 5; leaves alternate, with distinct internodes, or leaves verticillate 3
3. Ovary 1-chambered 4
 Ovary 2-chambered, or gynaeceum of more or less free carpels 5
4. Leaves alternate; filaments free 1. **Microtea**, *Swartz*
 Leaves verticillate; filaments connate at the base 2. **Adenogramma**, *Reichb*
5. Fruit wingless 4. **Limeum**, *Linn*
 Fruit with a marginal wing 5. **Semonvillea**, *Gay*
6. Inflorescence an axillary cyme 7
 Inflorescence a dense raceme 7. **Phytolacca**, *Linn.*
7. Filaments connate into a very short cup; ovary lobed, carpels not free 6. **Psammotropha**, *E. & Z.*
 Filaments free; carpels free 8. **Giesekia**, *Linn.*

2372

1. MICROTEA, Swartz

Flowers bisexual. *Perianth* 5-partite; lobes equal or nearly so, usually erect in fruit. *Stamens* 3-8, hypogynous; filaments free. *Ovary* 1-chambered, with a solitary basal ovule; styles 2-5, free or united at the base, papillose above. *Fruit* obovoid, more or less warted or spiny. *Seed* erect; embryo surrounding the starchy endosperm.

Annual herbs, usually branched; leaves alternate, entire; inflorescence a long slender spike or raceme; flowers small, white; bracts membranous, persistent.

Species about 10, found chiefly in tropical South America; 4 species in South Africa, extending from Little Namaqualand, Griqualand West, and Prieska to the Transvaal.

2374

2. ADENOGRAMMA, Reichb.

Flowers bisexual. *Sepals* 5, membranous, obtuse, *Petals* 0. *Stamens* 5; filaments subulate, dilated and connate into a cup at the base; anthers short, oblong. *Ovary* ovoid or conical, 1-chambered, with a solitary basal ovule; style short, filiform; stigma somewhat capitate. *Fruit* ovoid, conical-subulate or dagger-shaped, often gibbous at the base, dehiscent or indehiscent, smooth or granular. *Seed* ovoid, straight or curved; embryo hooked; endosperm fleshy.

Diffuse herbs, with dichotomous branches; leaves verticillate, those of the perennial branches imbricate; stipules minute or 0; inflorescence a terminal or axillary cyme, or umbel, or flowers in fascicles.

Endemic; species 7, extending from Namaqualand to Uitenhage.

2375

3. POLPODA, Presl

Flowers bisexual. *Sepals* 4, obovate, fimbriate-lacerated. *Petals* 0. *Stamens* 4, hypogynous; filaments filiform, longer than the sepals; anthers linear. *Ovary* compressed, 2-chambered, with a single ovule in each chamber;

style 2-partite, with filiform stigmatose branches. *Fruit* a capsule, broadly obcordate, 2-locular. *Seed* compressed, globose-reniform, granulated; embryo annular.

Diffuse undershrubs, with the branches densely covered with small leaves; leaves alternate, minute, oblong-lanceolate, adpressed to the stem, recurved at the apex; stipules large, scarious, fimbriated, adnate on either side to the margins of the leaves; flowers sessile between the stipules, solitary or fascicled; bracts and stipulary fringes densely spicate.

Endemic; species 1, recorded only from the Piquetberg and Cape districts.

2376

4. LIMEUM, Linn.

Flowers bisexual or unisexual. *Sepals* 5, unequal, ovate, herbaceous, with membranous margins. *Petals* 3-5, oblong, or spatulate, or minute, or 0. *Stamens* 5-10, sometimes imperfect, hypogynous; filaments subulate, dilated and connate at the base or free. *Ovary* sub-globose, 2-chambered, with a single basal ovule in each chamber; style short or very short, with 2 stigmatose branches. *Fruit* dividing into two 1-seeded cocci; cocci indehiscent, wingless, smooth, rugose or armed with small spines. *Seed* orbicular; embryo annular.

Annual or perennial herbs or woody, prostrate or erect; leaves alternate, fleshy, linear, lanceolate or obovate, entire or obscurely ciliate; stipules 0; inflorescence a dense terminal or sub-axillary cyme; flowers small, greenish; bracts 3.

Species about 15, natives of Africa, Arabia, and India; 8 species in South Africa, widely distributed.

2376a

5. SEMONVILLEA, Gay

Flowers bisexual. *Sepals* 5, sub-equal, herbaceous, with membranous margins. *Petals* 5, sub-rotund, clawed, or 0. *Stamens* 5-7; filaments dilated at the base and connate into a short cup; anthers oblong. *Ovary* compressed, ovoid, 2-chambered (the 2 carpels separable), with a single basal ovule in each chamber; styles 2, subulate; stigmas sub-capitate. *Fruit* orbicular, dry, formed of 2 separable 1-seeded indehiscent plano-convex carpels winged round the margin.

Slender glabrous annuals; leaves alternate, narrow-linear, slightly fleshy; stipules 0; inflorescence a lax sub-racemose elongated cyme; flowers small; bracts 3.

Species 2; one native of Senegal; the other of South Africa and found in Namaqualand, Barkly West and the Transvaal.

2379

6. PSAMMOTROPHA, E. & Z.

Flowers bisexual. *Sepals* 5, membranous, obtuse, equal. *Petals* 0. *Stamens* 5; filaments subulate, connate into a very short cup; anthers oblong. *Ovary* sub-globose, 3-5-lobed, 3-5-chambered, with a single basal ovule in each chamber; styles 3-5, short, recurved, free or connate at the base, dilated and stigmatose at the apex. *Fruit* 3-5-lobed, 3-5-locular, loculicidal, with the valves septiferous. *Seeds* sub-globose, granulate; embryo annular; endosperm sub-fleshy.

Rigid perennial herbs or small undershrubs, often densely leafy at the base; leaves rigid, linear or subulate; the lower densely crowded so as to be 4-angled; stem-leaves whorled; stipules small or 0; inflorescence an axillary cyme or umbel, or flowers in densely flowered clusters and minute.

Endemic; species 5, extending from Clanwilliam through the coastal belt to Natal, the eastern O.F.S., the Transvaal, and Basutoland.

2380

7. PHYTOLACCA, Linn.

Flowers bisexual, or unisexual and the plants dioecious. *Perianth* 5-partite; lobes equal, oblong, spreading or reflexed at a later stage. *Stamens* 5-25, inserted at the base of the perianth (rudimentary in the female flowers); filaments subulate, sometimes connate at the base; anthers oblong. *Ovary* globose, of 5-12 carpels, free or more or less connate, with a solitary basal ovule in each ovary; styles as many as the carpels. *Fruit* depressed-globose, fleshy. *Seeds* reniform, compressed, beaked or obtuse at the base; embryo annular, enclosing the endosperm.

Herbs or shrubs, rarely trees, erect or scandent; leaves alternate, entire, petiolate; inflorescence a dense raceme; pedicels bracteate and bi-bracteate.

Species 20, tropical and sub-tropical, mainly natives of America; a few in Africa, eastern Asia, the Himalayas, and Asia Minor; 4 species in South Africa, extending from Uitenhage to Natal, the O.F.S., Basutoland, and the Transvaal: also recorded from Somerset East and Burghersdorp.

2382

8. GIESEKIA, Linn.

Flowers bisexual, seldom unisexual. *Sepals* 5, herbaceous, equal, with membranous margins. *Petals* 0. *Stamens* 5-15, hypogynous, free, alternating singly or in parcels of 2-3 with the sepals; filaments subulate, dilated at the base; anthers oblong. *Gynæcium* of 2-5 free carpels, sessile on a small torus, with a solitary basal ovule in each ovary; styles short, decurrent on the inner angle of the carpels, stigmatose on the inner side. *Fruit* of 5 free compressed membranous papillose 1-seeded indehiscent carpels. *Seeds* compressed, sub-reniform, granulated; embryo annular.

Small annual or rarely perennial herbs; leaves opposite, alternate, or in false whorls, somewhat fleshy, linear or spatulate, generally paler beneath and dotted with hard immersed points; stipules 0; inflorescence a lax or dense axillary cyme; flowers small, sessile and pedicelled.

Species 5, natives of Africa, Arabia, and east India; 3 species in South Africa, extending from Komgha to Natal; also found in Griqualand West, Prieska, the O.F.S., the Transvaal and south to Cradock.

55. AIZOACEÆ.

Flowers regular, bisexual, or rarely plants dioecious with occasional bisexual flowers. *Calyx* of 4-5 sepals, or divided into 4-6 lobes down to the ovary, or produced into a short tube above the ovary. *Petals* many, free, or connate to form a tube, or absent. *Stamens* definite or indefinite; filaments subulate, erect or inflexed; anthers 2-theous. *Ovary* superior, half-superior, or inferior, 2 to many-chambered, with usually many ovules in each chamber; styles as many as the ovary-chambers, free or rarely united, sometimes styles 0 and stigma inconspicuous on top of the ovary. *Fruit* a capsule or drupaceous. *Seeds* solitary or many; embryo more or less curved; endosperm scanty or copious, starchy or very rarely fleshy.

Annual or perennial herbs or shrubs, sometimes prostrate or very dwarf and without a distinct stem; leaves opposite, alternate, or whorled, sometimes connate at the base only, or more or less completely connate to form the plant body; often fleshy and succulent; stipules absent or present; flowers solitary or variously arranged.

Genera 52; species about 500, found in most tropical and sub-tropical countries.

Tribe **Mollugineæ**: Calyx deeply 5-parted; petals 3 to many, or 0; ovary superior; fruit a capsule (genera 1-6).

Tribe **Aizoideæ**: Calyx-tube more or less elongated; petals 0; ovary superior; fruit a capsule (genera 7-12).

Tribe **Mesembryeæ**: Calyx divided down to the ovary or forming a tube; petals many or 0; ovary inferior, rarely semi-superior; fruit a capsule, nut-like, or drupaceous (genera 14-43).

1. Petals 0 2
- Petals many, or represented by staminodia 15
2. Ovary inferior 3
- Ovary superior 5
3. Fruit spiny; flowers in few-flowered heads **14. Tribulocarpus, Sp. Moore**
- Fruit nut-like or drupaceous, not spiny; flowers axillary, solitary or
 few, or in racemes 4
4. Flowers axillary **13. Tetragonia, Linn.**
- Flowers in racemes **15. Anisostigma, Schinz**
5. Stipules present, or the petiole connate or membranous forming a
 stipule-like structure 6
- Stipules absent 11
6. Calyx divided almost to the base 7
- Calyx with a distinct tube 9
7. Disc cupular, 3-5-fid; stipules lacerated or deeply fringed
 3. Pharnaceum, Linn. 8
- Disc 0; stipules undivided 8
8. Leaves dilated and amplexicaul at the base; stipules adnate to the
 sheathing base **4. Hyperstelis, E. Mey.**
- Leaves not dilated at the base and adnate to the stipules
 1. Mollugo, E. Mey.
9. Leaves in a radical rosette **5. Coelanthum, E. Mey.**
- Leaves opposite 10
10. Style simple, or styles 2 **8. Trianthema, Linn.**
- Styles 3-5 **7. Sesuvium, Linn.**
11. Calyx divided almost to the base **2. Glinus, Linn.**
- Calyx with a distinct tube 12
12. Stamens 5; silky densely leafy shrubs **9. Plinthus, Fenzl.**
- Stamens 8 to many; herbs or shrubs, glabrous, pubescent, tomentose,
 or papillose, not silky 13
13. Stamens twice as many as the calyx-lobes, in groups of 2 (1 long
 and 1 short) alternating with the sepals **10. Galenia, Linn.**
- Stamens more than twice as many as the sepals, if 10 then calyx-lobes
 fleshy 14
14. Styles 2 **11. Acrosanthes, E. & Z.**
- Styles 4-5 **12. Aizoon, Linn.**
15. Ovary superior **6. Orygia, Forsk.**
- Ovary inferior or half-superior 16
- *16. Seeds (and ovules) arising from a central axis (placentation axile) 17
- Seeds (and ovules) arising from a placenta down the centre of the
 outer wall or floor of the chambers (placentation parietal), or in the
 genus *Punctillaria* also from the lower part of the central axis, not
 flat or winged; ovary entirely inferior, except in *Oophytum* and
 Fenestraria, but in *Mesembrianthemum* the top of the ovary often
 has a thick prominent solid portion giving it a false half-superior
 appearance 26

*N.B.—The structure of the fruit can only be ascertained by wetting it or soaking it in water until the valves—when valves are present—fully expand. But the part of the chambers (placenta) to which the ovules and seeds are attached is most easily seen by making a transverse or longitudinal section through a ripe or nearly ripe fruit—N. E. Brown.

17. Fruit 1-chambered, indehiscent, without valves; seeds large, flat, broadly winged all round, arranged in a single whorl around the central axis; annuals 18
 Fruit half or more than half-superior, 4-5-chambered, opening when wetted by 4-5-valves; valves with the expanding keels closely contiguous or united into one central keel, and with a broad membranous wing on each margin; chambers open, without wings or tubercles; seeds many in a chamber, not flat or winged 19
18. Style funnel-shaped, with 9-12 papilla-like stigmas on the surface of its rim 33. *Hymenogyne*, *Haw.*
 Style none or very short; stigmas 8-12, filiform 32. *Thyrasperma*, *N. E. Br.*
19. Leaves all or many of them alternate 20
 Leaves all opposite, perennials 24
20. Leaves with a distinct tubular sheath; petals passing into staminodes; perennials 21
 Leaves sessile or stalked, without a tubular sheath, and flat, channelled, semi-terete or terete; staminodes none 22
21. Stems not evident; leaves two to a growth, cylindric, pulpy, 4-6 lines thick; petals stiff 26. *Dactyloopsis*, *N. E. Br.*
 Stems evident, erect, with more than two alternate and opposite semi-terete or sub-trigonus leaves spaced along them; petals not stiff 27. *Aspazoma*, *N. E. Br.*
22. Stemless perennials, with a tuberous rootstock; leaves 10-12, crowded into small tufts 34. *Phyllobolus*, *N. E. Br.*
 Stems evident, with leaves spaced along them 23
23. Annuals, covered with glittering papillæ; stems often prostrate; stamens erect, with long filaments 30. *Cryophytum*, *N. E. Br.*
 Perennials, branches stout, erect; leaves withering and persisting as sharp spines, or the base only persisting as a hard fragment; stamens with short and apparently incurved filaments 28. *Amoebophyllum*, *N. E. Br.*
24. Leaves united at the base into a short sheath, bearing a ring of deflexed hairs or cilia; plants dwarf and densely branched; staminodes 0 40. *Trichocyclus*, *N. E. Br.*
 Leaves scarcely or but shortly united at the base, without deflexed hairs or cilia 25
25. Branches prostrate or decumbent; leaves ovate to linear-lanceolate, often (always?) withering to a skeleton and persisting; stamens connivent-erect, passing into staminodes 29. *Scelctium*, *N. E. Br.*
 Mostly erect bushes, a few species decumbent; leaves terete or semi-terete, not withering to a skeleton, deciduous, leaving naked stems; staminodes none 39. *Psilocaulon*, *N. E. Br.*
26. Stigma 1, sessile, circular or oval; calyx produced above its union with the ovary into a tube or cup, 6-8-lobed above; leaves 2-4 to a growth, very smooth, dotless; ovary and fruit 10-24-chambered 27
 Stigmas and chambers of the ovary and fruit 8-20 (in *Glottiphyllum* rarely only 7); petals free or united at the base into a ring, no distinct tube; style 0; stigmas filiform, subulate, plumose or flattish and slightly branched, or stigmas and chambers of the ovary and fruit 4-7; fruit opening when wetted by 4-7 valves provided with expanding keels (one species of *Glottiphyllum* also has only 7-8 stigmas and chambers) 28
27. Leaves several times as long as broad, sub-terete, but flattened on the face; flower on an elongated pedicel; stamens all abruptly bent down into the calyx-tube 22. *Roodia*, *N. E. Br.*
 Leaves from as broad as long to twice as long as broad, ovate to oblong, flat above, whitish; flowers sessile; stamens some ascending, but the majority inflexed into the calyx-tube 21. *Argyroderma*, *N. E. Br.*

28. Stigmas and chambers of the ovary and fruit 4-7 29
 Stigmas and chambers of the ovary and fruit 8-20 (in *Glottiphyllum* rarely only 7) 35
29. Each growth, plant, or division of the plant consisting of a small globose obconic ovoid or oblong fleshy body, entire, notched, or equally, rarely unequally lobed at the top 30
 Each growth or division of the plant either consisting of an obliquely ovoid or sub-cylindric body with an oblique mouth-like fissure at or below the middle on one side of it, or (under cultivation) bearing 2-4 very unequal opposite leaves, with the smaller of each pair united for at least half its length to the larger one ; calyx 6-lobed, no tube above the ovary ; stigmas 6, plumose or each growth, branch or entire plant with two to many evident leaves, spreading ascending, or with their upper faces pressed together into a beak-like or globose form, free or variously united or sheathing at the base, when opposite, those of each pair equal or only slightly unequal in length 32
30. Bodies with a small central orifice or a very small apical fissure, with its lips closed together 31
 Bodies with a transverse fissure all across the top dividing it into two truncate or convex lobes, or in the seedling stages with a central orifice ; calyx without a tube above the inferior ovary, 4-6-lobed ; petals free ; style none or very short ; stigmas filiform 19. *Lithops*, *N.E.Br.*
31. Calyx with an elongated membranous tube, 4-6-lobed ; petals united below into a distinct tube ; style usually evident, rarely absent ; ovary inferior 17. *Conophytum*, *N.E.Br.*
 Calyx with a very short green tube, 6-lobed ; petals free ? ; style none ; ovary half or more than half-superior 18. *Oophytum*, *N.E.Br.*
32. Each growth or division of the plant with an oblique mouth-like fissure at or below the middle on one side of it 20. *Gibbæum*, *Haw.*
 Each growth, branch, or entire plant with two to many evident leaves, spreading, ascending, or with their upper faces pressed together into a beak-like or globose form 33
33. Petals united below into a distinct tube ; very small stemless plant with a cluster of small clavate leaves truncate at the apex ; flowers sessile or sub-sessile ; calyx with a short green tube above the ovary ; stigmas 5 36. *Frithia*, *N.E.Br.*
 Petals free or only united into a mere ring at the base, not into an evident tube or cup ; perennials or rarely annuals, mostly with evident stems, but sometimes stemless ; ovary inferior, rarely with the chamber part partly superior but sometimes with the solid top very prominent so as to appear partly superior ; mostly bushes 34
34. Calyx produced above its union with the ovary into a very short tube bearing the petals and stamens ; petals passing into staminodes that more or less conceal the rather short incurved stamens ; stigmas minute, obtuse 41. *Eresia*, *N.E.Br.*
 Calyx not produced into a tube above the ovary ; petals and stamens arising at the margin of the ovary ; stamens erect, not concealed ; stigmas not minute, acute 16. *Mesembrianthemum*, *Linn.*
35. Leaves alternate, crowded into a tuft, very long and narrow, soft, not dotted ; fruit very conical at the top, opening by valves which stand erect and have no expanding-keels to cause them to expand when wetted 37. *Conicosia*, *N.E.Br.*
 Leaves opposite 36
36. Fruit indehiscent (no valves), fleshy, edible ; stamens erect ; stems trailing ; flowers large ; stigmas 10-16 43. *Carpobrotus*, *N.E.Br.*
 Fruit a dry capsule, opening, when wetted, by valves provided with expanding-keels 37

37. Petals with a slender stalk and a small elliptic or obovate blade, lax ;
stamens concealed, abruptly incurved ; stigmas 8-10, in a small
star **42. Piquetia**, *N.E.Br.*
Petals cuneately linear, linear, or filiform, not stalked ; stigmas 8-20
(7-8 in *Glottiphyllum ochraceum*) 38
38. Annuals ; leaves flat ; chambers of the fruit without a tubercle at the
opening **31. Carpanthea**, *N.E.Br.*
Perennials ; stemless or (except on the branches of *Cephalophyllum*)
without distinct internodes between the pairs of thick (not flat)
leaves ; chambers of the fruit, where known, with a tubercle partly
covering the opening 39
39. Leaves soft and pulpy, long, green, not at all glaucous nor dotted ;
calyx 4 (in *G. ochraceum*, 5)-lobed, **24. Glottiphyllum**, *Haw.*
Leaves firm, glaucous-green, grey-green, brownish, whitish-green, or
nearly white, distinctly or indistinctly dotted ; calyx 5-lobed 40
40. Stigmas filiform ; leaves elongated, stout and thick, grey-green or
brownish, conspicuously dotted **23. Punctillaria**, *N.E.Br.*
Stigmas plumose 41
41. Leaves club-shaped, erect, clustered, truncate at the apex, incon-
spicuously dotted **35. Fenestraria**, *N.E.Br.*
Leaves never club-shaped nor truncate (except in side view) at the
apex 42
42. Leaves in 1-2 (or under cultivation 3) pairs to a growth, at first closed
together and somewhat resembling a bird's beak, and the basal
part when withered forming a sheath around or enclosing the
next pair, conspicuously dotted or white **25. Cheiridopsis**, *N.E.Br.*
Leaves tufted on the main stem and usually on the branches, not closed
together, nor their basal part, when withered, forming a sheath
around the next pair, long, not stout, sub-terete or 3-angled,
finely pellucid-dotted **38. Cephalophyllum**, *Haw.*

2387

1. MOLLUGO, Linn.

Flowers bisexual. *Calyx* 5-parted, with membranous margins. *Petals* 0. *Stamens* 3-10, hypogynous, those of the inner row alternating with the sepals or, when fewer than 5 then opposite the ovary lobes ; filaments filiform-subulate ; anthers linear-oblong. *Disc* 0. *Ovary* ovate, 3-5-chambered, with many ovules in each chamber ; styles 3-5, linear. *Fruit* a membranous capsule included in the calyx, 3-5-angled, loculicidally 3-5-valved. *Seeds* numerous on short ascending cords (funicles), reniform, smooth or tubercled, without an appendage of the funicle.

Annual or perennial herbs, procumbent, glabrous or with stellate hairs ; leaves alternate or whorled, entire or toothed ; stipules membranous, fugaceous, undivided ; inflorescence an axillary umbellate cyme, or flowers in clusters.

Species about 19, found in all warm countries ; 4 species in South Africa, found in S. W. Africa, Little Namaqualand, Clanwilliam, through Prieska and Bechuanaland to the Transvaal. A cosmopolitan species recorded from Natal.

2388

2. GLINUS, Linn.

Flowers bisexual. *Calyx* 5-parted, with membranous margins. *Petals* 0. *Stamens* 3 to many at the base of the calyx, free or united in bundles ; the outer sometimes abortive and resembling petals ; filaments subulate ; anthers oblong. *Ovary* ovate, 3-5-chambered, with many ovules in each chamber ; styles 3-5. *Fruit* a membranous capsule, ovoid, 3-5-angled, 3-5-furrowed, loculicidally 3-5-valved. *Seeds* numerous, fixed to long ascending cords (funicles), reniform, smooth or tubercled, crowned by an apical appendage of the funicle.

Annual herbs or sub-fruticose, glabrous or with stellate hairs; leaves alternate or in false whorls, entire or toothed; stipules 0; flowers in clusters or umbels opposite the leaves, or solitary at the nodes.

Species 10, found in all tropical and sub-tropical countries; 2 species in South Africa, recorded from George and the northern Transvaal.

2389

3. PHARNACEUM, Linn.

Flowers bisexual. *Calyx* 5-parted, sub-equal, with membranous margins, persistent. *Petals* 0. *Stamens* 3-5, sub-perigynous, alternating with the sepals; filaments filiform; anthers oblong or globose. *Hypogynous disc* cupular, 3-5-fid, rarely obsolete. *Ovary* sub-globose or oblong, 3-5-chambered, with many ovules in each chamber; styles 0, stigmas 3, obovate or cuneate, sometimes petaloid, rarely elongated. *Fruit* a membranous capsule, 3-5-locular, loculicidally 3-5-valved, many-seeded. *Seeds* 4-8 in each loculus, globose-lenticular, with the margin acute, or sub-globose with a raised dorsal line, without an appendage, with the testa often shining, smooth, granulate, or reticulate.

Small slender undershrubs or herbs, rarely annual; leaves alternate or in false whorls, linear, needle-like, obovate, or spatulate, often with a bristle at the apex; stipules lacerated or deeply fringed; inflorescence an axillary or terminal peduncled racemose cyme umbel or head.

Endemic; species 18, distributed from S. W. Africa through the coastal belt to Natal; also found in the Transvaal, the O.F.S., Basutoland, Criquealand West; rare in the central districts.

2390

4. HYPERSTELIS, E. Mey.

Flowers bisexual. *Sepals* 5-parted, with membranous margins, coloured. *Petals* 0. *Stamens* 3-5 or 12-16 in two rows; the 5 outer alternating with the sepals, shorter; the inner connate at the base and longer or 20-30 in 3-5 bundles opposite the dissepiments of the ovary, connate at the base, alternating with a few free stamens; anthers oblong. *Hypogynous disc* none. *Ovary* 3-5-chambered, with many ovules in each chamber; style 0; stigmas 3-5, fleshy, recurved. *Fruit* a capsule, ellipsoid, 3-5-furrowed, 3-5-locular, loculicidally dehiscent into 3-5 valves. *Seeds* lenticular or pyriform, very smooth, shining, without an appendage.

Annual or perennial herbs, or small undershrubs; leaves alternate and crowded or verticillate, glaucous, filiform, blunt, somewhat fleshy, dilated and amplexicaul at the base; stipules adnate to the sheathing base of the petiole, tooth-like, not lacerated; flowers in umbels on long peduncles, rarely shorter than the leaves.

Endemic; species 5, with a central distribution from S. W. Africa, through Bechuanaland into the O.F.S. and the Transvaal, and southwards through Middelburg, Cradock and Queenstown, with a species in Uitenhage and Riversdale.

2391

5. COELANTHUM, E. Mey.

Flowers bisexual. *Calyx-tube* campanulate; lobes 5, obtuse, with petaloid margins. *Petals* 0. *Stamens* 5, perigynous, inserted between the lobes of the calyx; filaments short; anthers linear, sagittate. *Hypogynous disc* 0. *Ovary* oblong, 3-chambered, with many ovules in each chamber; styles 3, linear, papillose. *Fruit* a capsule, included in the calyx, membranous or chartaceous, linear-oblong, 3-angled, 3-locular, loculicidally 3-valved, many-seeded. *Seeds* sub-globose, acute, without an appendage, reticulated.

Annual herbs, with scape-like dichotomous stems; leaves in a radical rosette, linear-lanceolate or spatulate, blunt or aristate, the stem-leaves

verticillate ; stipules fimbriate-lacerated ; inflorescence a lax terminal dichotomous raceme-like cyme.

Endemic ; species 2, recorded from Little Namaqualand and the Cape.

2393

6. *ORYGIA*, Forsk.

Flowers bisexual. *Sepals* 5, ovate, cuspidate, with membranous margins. *Petals* (staminodia ?) many, narrow, shorter than the sepals, connate at the base. *Stamens* many (12-40), inserted at the base of the calyx, subhypogynous ; filaments filiform ; anthers linear-oblong. *Ovary* sub-globose, 5-chambered, with many ovules in each chamber ; styles 5, filiform. *Fruit* a capsule, included in the calyx, surrounded at the base by the cup formed by the petals, 5-locular, loculicidally 5-valved, many-seeded. *Seeds* compressed, reniform, with a minute aril, or aril 0.

Diffuse rigid herbs, glabrous, glaucous ; leaves opposite or alternate, somewhat fleshy, petioled, obovate, cuspidate ; stipules 0 ; inflorescence a lax few-flowered terminal cyme, or cymes opposite the leaves.

Species 1, native of Africa, Arabia, and east India. In South Africa found in Prieska and Herbert and extends into the Transvaal, and then south through the coastal belt from Natal to Uitenhage.

2394

7. *SESUVIUM*, Linn.

(*Diplochonium*, Fenzl.)

Flowers bisexual. *Calyx-tube* turbinate ; lobes 5, oblong, obtuse. *Petals* 0. *Stamens* 5, inserted high up in the calyx-tube, alternating with the lobes, or stamens many ; filaments filiform, sometimes connate at the base ; anthers didymous. *Ovary* superior, free, 3-5-chambered, with many ovules in each chamber ; styles 3-5, longitudinally papillose. *Fruit* a capsule, oblong, membranous, 3-5-locular, transversely dehiscent in the middle ; loculi many-seeded. *Seeds* sub-reniform, smooth, with a long funicle ; embryo annular.

Herbs or undershrubs, erect or prostrate, succulent ; leaves opposite, fleshy, linear or oblong ; stipules 0, or the petiole sometimes connate to form a stipule-like structure ; flowers axillary, sessile or stalked, solitary or clustered, or rarely inflorescence sub-cymose ; bracts 2 or 0.

Species about 6, natives of the coast belts of the tropics ; 3 species in South Africa ; 2 from S. W. Africa, 1 from Delagoa Bay.

2395

8. *TRIANTHEMA*, Linn.

Flowers bisexual. *Calyx-tube* short, or sub-elongated and campanulate ; lobes 5, short or large, often arched, coloured within, dorsally mucronate. *Petals* 0. *Stamens* 5-8, solitary or fascicled, alternating with the calyx-lobes ; filaments filiform ; anthers short. *Ovary* superior, sessile, somewhat terete, truncate, 1-2-chambered, or gynaeceum of 1-2 more or less free carpels, with 1 or few ovules in each chamber or carpel ; styles 2 or style 1, excentric, longitudinally papillose. *Fruit* a membranous or coriaceous capsule, cylindric or turbinate, 1-2-locular, with 1 or more seeds, transversely dehiscent in the middle. *Seeds* sub-reniform, with an elongated funicle ; embryo annular.

Herbs, rarely undershrubs, diffuse, prostrate, glabrous, pubescent or sub-papillose ; leaves opposite, petioled, obovate, ovate or linear, entire ; stipules 0, but the petioles membranous and stipule-like ; flowers axillary, solitary, or in cymes or fascicles, sessile or peduncled, rarely sub-spicate on the terminal branches ; bracteoles 2.

Species about 22, natives of the warm parts of Asia, Africa, Australia, and western India ; 3 species in South Africa mostly western, found in South-west Africa and Prieska to the Transvaal ; 1 species in Prince Albert.

2398

9. PLINTHUS, Fenzl.

Flowers bisexual. *Calyx-tube* cylindric; segments 5, sub-equal, erect, coloured within. *Petals* 0. *Stamens* 5, inserted low down in the calyx-tube, almost hypogynous, alternating with the calyx-lobes; filaments exerted. *Ovary* superior, 3-chambered, with a solitary pendulous ovule in each chamber; styles 3, cohering at the base, papillose. *Fruit* a capsule, ovoid, densely papillose, 3-locular, loculicidally 3-valved, 3-seeded. *Seeds* pear-shaped, with an elongated funicle; embryo curved.

Small low shrubs, silky, densely leafy; leaves opposite and alternate, imbricate, small, ovate, more or less 3-angled; stipules 0; flowers minute, axillary, sessile; bracteoles 1-2.

Endemic; species 3, found in S. W. Africa, Prieska, and the Transvaal.

2399

10. GALENIA, Linn.

Flowers bisexual. *Calyx-tube* turbinate or hemispherical; segments 4-5, spreading. *Petals* 0. *Stamens* 8-10, in 4-5 sets, alternating with the sepals, unequal, with a long and short stamen in the axil of each sepal; filaments filiform; anthers short. *Ovary* superior, 2-5-chambered, rarely 1-chambered, with a solitary pendulous ovule in each chamber; styles 2-5, papillose. *Fruit* a capsule, compressed or 2-5-angled, 2-5-locular, rarely 1-locular and then indehiscent, loculicidally 2-5-valved, 1-seeded in each loculus. *Seeds* oblong or reniform, on a long basal funicle, compressed; embryo curved.

Herbs or branched undershrubs, glabrous, tomentose, pubescent, scaly, or papillose; leaves opposite or alternate, small, entire; stipules 0; flowers small, axillary, sessile or stalked, sometimes in cymes at the ends of the branches.

Endemic; species 24, widely distributed in the western part of South Africa, not recorded from the Transvaal, Natal, nor the eastern districts; only recorded as far east as East London.

2400

11. ACROSANTHES, E. & Z.

Flowers bisexual. *Calyx-tube* short, turbinate; lobes fleshy, acuminate, keeled, erect, coloured within. *Petals* 0. *Stamens* 10-40, irregularly inserted, or in bundles on top of the calyx-tube; filaments filiform; anthers short or linear-oblong. *Ovary* superior, oblong, completely or incompletely 2-chambered, with a single basal ovule in each chamber, rarely ovules 2; styles 2, short, papillose. *Fruit* a capsule, sub-globose, imperfectly 2-locular, 2-seeded, loculicidally 2-valved. *Seeds* large, reniform, deeply pitted.

Glabrous undershrubs; leaves opposite, somewhat thick, sessile or narrowly petioled, connate at the base, linear or lanceolate, acuminate, with recurved margins; stipules 0; flowers small, solitary, on long or short pedicels.

Endemic; species 4, found in the south-western districts from Clanwilliam to Caledon.

2401

12. AIZOON, Linn.

Flowers bisexual. *Calyx-tube* turbinate or hemispherical, sometimes very short; lobes 4-5, spreading, valvate or imbricate, often coloured within. *Petals* 0. *Stamens* many, often about 20, inserted in the calyx-throat, grouped in bundles alternating with the calyx-lobes; filaments filiform; anthers oblong. *Ovary* superior, included in the calyx-tube, 4-5-angled, 4-5-chambered, with 2 to many ovules in each chamber; styles 4-5, free, filiform, papillose. *Fruit* a capsule, sub-corky or sub-woody, crowned by

the persistent calyx, 5-locular, dehiscing at the apex in a stellate manner; loculi 2 to many seeded. *Seeds* small, pendulous on an elongated funicle, compressed, sub-reniform, sometimes granulated; embryo cylindric, curved.

Herbs or undershrubs, very often papillose-pubescent or tomentose; leaves alternate, rarely opposite, sessile or petioled; stipules 0; flowers axillary, solitary, or on divaricate branches arranged in a cymose manner.

Species about 20, natives of southern Europe, Africa, Arabia, and the Canary Islands; 3 species in Australia; 12 species in South Africa, widely distributed through the south-eastern and south-western districts and extend over the central region, S.W. Africa and Natal; not recorded from the Transvaal.

2403

13. TETRAGONIA, Linn.

Flowers bisexual. *Calyx* 3-5-lobed. *Petals* 0. *Stamens* inserted on the calyx-tube, 1 or more, solitary or in fascicles; filaments filiform; anthers oblong. *Ovary* inferior, 3-8-, rarely 1-2-, chambered, with a solitary pendulous ovule in each chamber; styles as many as the ovary chambers, subulate, short or sub-elongated, papillose. *Fruit* nutlike or drupaceous, obovoid or angled, sometimes broadly winged or horned, indehiscent. *Seeds* sub-reniform, with a membranous testa; embryo curved, sub-cylindric.

Herbs or undershrubs, prostrate or sub-scandent, glabrous, pilose or papillose; leaves alternate, oblong, linear, ovate or deltoid, entire, somewhat thick; stipules 0; flowers axillary, solitary or few, sessile or on long pedicels, sometimes inflorescence sub-spicate.

Species about 75, natives of Africa, eastern Asia, Australia, and south temperate America; 31 species in South Africa, found in the south-western and south-eastern districts, but recorded from S. W. Africa and from the central region; not recorded from the Transvaal nor Natal, but only extends as far east as East London.

2403a

14. TRIBULOCARPUS, Sp. Moore

Flowers bisexual, with occasional unisexual flowers. *Male flowers*: *Calyx-tube* short; limb 5-parted, lobes imbricate. *Bisexual flowers* similar to the male, but the calyx with a cylindric tube widened above. *Petals* 0. *Stamens* numerous, inserted in the mouth of the calyx; filaments connate at the base. *Female flowers*: *Ovary* inferior, continuous with the floral-axis, surrounded by bracts, 2-chambered, with a solitary pendulous ovule in each chamber; style with 2 branches. *Fruit* compound, surrounded by the hardened spiny bracts. *Seeds* with a crustaceous testa; embryo curved, endosperm scanty.

A mealy undershrub; leaves alternate, simple, obovate; stipules 0; inflorescence a few-flowered pedunculate head; the central flowers (sometimes all or almost all) bisexual and a few lateral flowers male.

Endemic; species 1, only known from S. W. Africa.

2404

15. ANISOSTIGMA, Schinz

Flowers bisexual. *Calyx* 5-lobed. *Petals* 0. *Stamens* 5, alternating with the calyx-lobes; filaments filiform; anthers oblong. *Ovary* inferior, turbinate, 1-chambered; styles 4, unequal, 2 elongated and papillose, 2 short without papillæ. *Fruit* nut-like, obovoid, 3-winged, indehiscent, 1-locular, with a single seed; embryo curved.

A glabrous shrub; leaves alternate; inflorescence a raceme. Endemic; species 1, only known from S. W. Africa.

2405

16. *MESEMBRIANTHEMUM, Linn.

Calyx 4-6-lobed down to its union with the ovary. *Petals* numerous, free. *Stamens* numerous, erect. *Ovary* inferior, with 5 (or occasionally 4, 6, or rarely 7) chambers; placentas on the outer walls of the chambers; style none; stigmas 5 (or occasionally 4, 6, or rarely 7), stout with an acute point, or subulate, rarely plumose. *Fruit* a dry capsule, with 5 (or occasionally 4, 6, or rarely 7) valves and loculi; valves with a pair of expanding keels on their inner face and, when wetted, spreading out flat or recurving; expanding keels with membranous wings on their outer margin or with membranous tips; loculi roofed with membranous wings, but without tubercles at the openings. *Seeds* small, ovoid or compressed-ovoid, not flattened nor winged.

Succulent perennials, rarely annuals, varying in habit, but usually having distinct internodes; leaves opposite, sessile or slightly united at the base, never flat, those of each pair equal in size. (Type *M. umbellatum*, Linn.).

Species very numerous, mostly natives of South Africa and widely distributed, but chiefly found in the central districts.

2405a

17. CONOPHYTUM, N. E. Br.

Calyx produced above the ovary into a distinct membranous tube, 4-6-lobed at the top. *Corolla* with a distinct slender tube and numerous linear lobes or petals. *Stamens* few or many, erect, included in or partly exerted from the corolla-tube. *Ovary* inferior, 4-6-chambered; placentas on the outer wall or floor of the chambers; style long or short, rarely nearly absent; stigmas 4-6, filiform. *Fruit* a capsule, with 4-6 valves and loculi; valves with a pair of closely contiguous expanding keels down their centre; loculi open, without wings, no tubercle at the opening. *Seeds* minute, ovoid.

Very small tufted plants, usually stemless; each growth or division of the plant consisting of a globose obconic ovoid or oblong fleshy body, formed of two leaves fused together; fused leaves entire, notched or 2-lobed at the top, with a small central orifice through which the flower protrudes.

Species numerous, all natives of the Karroo region of South Africa.

2405b

18. OOPHYTUM, N. E. Br.

Calyx produced above its union with the ovary into a very short green tube, sub-equally 6-lobed above. *Corolla* with numerous petals; petals in 2-3-series, possibly free, but in the withered flowers seen apparently united into a very short tube at the base. *Stamens* many, erect. *Ovary* half-superior, depressed and 6-ridged on the top, 6-chambered; placentas on

* The genus *Mesembrianthemum* of books. :—Until quite recently the plants dealt with under the following genera have all been included under the one genus *Mesembrianthemum* and the genera into which I am dividing it do not, I feel sure, represent all that will be ultimately separated from it, because there are several types included under *Mesembrianthemum* of which I have not yet been able to obtain flowers, fruit and seeds, all of which it is usually necessary to examine to enable a correct opinion to be formed as to whether any particular type is generically distinct or not. For this reason the key and characters of the genera that follow must not be taken to represent a revision of the whole of the plants hitherto included in the genus *Mesembrianthemum*, but as an attempt to refer some of them to separate genera as a basis for future investigation.

As I find that a difference in the habit and the character of the foliage of these plants usually coincides with some difference in the structure of the flower or fruit, indicating a generic distinction, and as in most cases the genera can be easily recognised when out of flower by their vegetative characters alone, I have used the latter as of primary importance throughout. It is strange that the characters afforded by the fruit of these plants has never been used for classificatory purposes before, and do not appear to have even been investigated, although they are, I believe, the most complicated fruit structures in existence.—N. E. Brown.

the floor of the chambers ; style none ; stigmas 6, subulate. *Fruit* a capsule, with 6 valves and 6 loculi ; valves with stout central contiguous expanding-keels and large sub-rectangular membranous spreading marginal wings ; loculi without wings and without tubercles. *Seeds* several in each loculus, small, compressed-ovoid, with a nipple at the smaller end, smooth.

Small stemless tufted perennials ; each growth or division of the plant consisting of a small ovoid fleshy body with a small slit-like orifice at the apex, through which the flower emerges.

Endemic ; species 1 : only recorded from the Van Rhynsdorp district (Type *O. oviforme*, N.E.Br.).

2405c

19. LITHOPS, N. E. Br.

Calyx not membranous, compressed, 4-7- (usually 5-6-) lobed, without any tube above the ovary. *Petals* many, free to the base. *Stamens* numerous, erect, in a columnar cone. *Ovary* inferior, 4-7-chambered ; placentas on the outer walls or floor of the chambers ; style short or almost absent ; stigmas 4-7, filiform. *Fruit* a small capsule, with 4-7 valves and loculi ; valves with one stout central expanding-keel and broad membranous marginal wings ; loculi open, without wings or a tubercle. *Seeds* minute, slightly compressed-ovoid, with a nipple at one end.

Stemless perennials, solitary or tufted, in nature mostly buried in the ground so that their tops are about level with the surface ; each growth or plant consisting of a small obconic or slightly compressed sub-cylindric fleshy body, with a transverse fissure all across the top dividing it into two short contiguous lobes, flat or slightly convex at the top, or in seedling stages with a very small central orifice as in *Conophytum*. (Type *L. Lesliei*, N.E.Br.)

Endemic ; species 12 or more, found in S. W. Africa and the central districts.

2405d

20. GIBBAEUM, Haw.

Calyx 6-lobed down to the top of the ovary. *Petals* not seen, apparently free. *Stamens* erect. *Ovary* inferior, 6-chambered ; placentas on the outer walls of the chambers ; stigmas 6, plumose. *Fruit* a capsule, with 6 valves and loculi ; each valve with two diverging expanding-keels and with broad obtuse membranous wings.

Small tufted succulent perennials, stemless or with short prostrate stems ; each growth consisting of an obliquely-ovoid or oblong-ovoid or sub-cylindric fleshy body, with a fissure on one side of it resembling a closed or slightly open mouth, formed of two very unequal leaves fused into a solid body, or (under cultivation) the leaves more widely separated and the smaller united to the larger for at least half its length ; flowers exerted from the fissure on distinct pedicels. (Type *G. pubescens*, N.E.Br.)

Endemic ; species 5, found in the Karroo.

2405e

21. ARGYRODERMA, N. E. Br.

Calyx with a distinct cup-shaped tube above its union with the ovary, 6-lobed above. *Petals* numerous, free, linear, arising from the top of the calyx-tube. *Stamens* very numerous, arising from the top of the calyx-tube, some ascending, but the majority are inflexed into the calyx-tube. *Ovary* inferior, 10-24-chambered ; placentas on the outer wall or floor of the chambers ; stigmas small, sessile or sub-sessile, circular or elliptic, entire or faintly crenulate. *Fruit* a broad and shallow capsule, with 10-24 valves and loculi ; each valve with a pair of expanding-keels ending in awn-like points, not winged ; loculi shallow, roofed with flexible wings and their opening nearly closed by a large tubercle.

Stemless succulent perennials, tufted or consisting of a single growth; leaves 2 (or, when a new growth is forming, 4) to each plant or growth, short and thick, ovate, flat above, very convex on the back, firm, very smooth, white or whitish; flower solitary, sessile or sub-sessile between the leaves, bracteate. (Type *A. testiculare*, N.E.Br.).

Endemic; species 5, found in Namaqualand and the Karroo.

2405f

22. ROODIA, N. E. Br.

Calyx with a distinct tube above its union with the ovary, 6-lobed above. *Petals* numerous, free, linear, arising from the top of the calyx-tube. *Stamens* very numerous, arising from the top of the calyx-tube and all abruptly bent down into the tube in a ring. *Ovary* inferior, 12-14-chambered, slightly concave on the top; placentas on the floor or outer wall of the chambers; stigmas small, sessile, circular, entire. *Fruit* a broad and shallow capsule, flat on the top, with 12-14 valves and loculi; each valve with 2 brown expanding-keels half as long as the valve, having membranous marginal wings and ending in membranous points; loculi roofed with rather rigid wings and the opening nearly closed by a tubercle.

Stemless tufted succulent perennial, leaves 2 (or, when making a new growth, 4) to a growth, opposite, united at the base, sub-terete but flattened on the face, firm, smooth, not dotted; flower solitary, terminal, peduncled and bracteate. (Type, *R. digitifolia*, N.E.Br.).

Endemic; species 1, only recorded from Van Rhynsdorp.

2405g

23. PUNCTILLARIA, N. E. Br.

Calyx produced above the ovary into a shallow cup or short tube, 5-lobed above. *Petals* numerous, free, linear, arising with the stamens from the top of the calyx-tube. *Stamens* numerous, erect; staminodes none. *Ovary* inferior, 10-12-chambered; placentas on the outer wall of the chambers and extending part of the way up the central axis; style none; stigmas 10-12, filiform. *Fruit* a capsule, with 10-12 valves and loculi; each valve with a pair of parallel expanding-keels; often ending in membranous points and with or without membranous wings at the sides; loculi roofed with rigid wings having their outer ends turned back and forming a somewhat trumpet-shaped opening to the loculus, which is nearly closed by a large tubercle.

Very dwarf succulent perennials, stemless or nearly so, without internodes; leaves 2-4 (under cultivation sometimes 6) to a growth or plant, opposite, thick and fleshy, very firm, usually conspicuously dotted; flowers terminal, solitary or 2-3 together, sessile or very shortly pedicellate, bracteate. (Type *P. magnipunctata* N. E. Br.).

Endemic; species several, found in the Karroo.

2405h

24. GLOTTIPHYLUM, Haw.

Calyx 4-, rarely 5-lobed. *Petals* numerous, free, cuneate-linear. *Stamens* numerous, erect; staminodes none. *Ovary* inferior, 7-10-chambered; placentas on the outer wall of the chambers; style none; stigmas 7-10, radiating, stout, plumose. *Fruit* a shallow and broad capsule, with 7-10 valves and loculi; each valve with a pair of expanding-keels ending in fine awn-like points, without marginal wings; loculi roofed with rigid wings and their opening nearly closed by a large tubercle. *Seeds* small, ovoid.

Very dwarf succulent perennials, branching close to the ground, without internodes; leaves 4 or more to a branch, opposite, crowded or closely placed, long, soft and pulpy, green, not dotted; flowers solitary, lateral; bracts 0. (Type, *G. linguiforme*, N. E. Br.).

Endemic; species several, found between the Cape and Albany districts.

2405i

25. CHEIRIDOPSIS, N. E. Br.

Calyx 4-5-lobed down to the top of the ovary. *Petals* numerous, free. *Stamens* numerous, erect. *Ovary* inferior, 8-19-chambered; placentas on the outer walls of the chambers; style none; stigmas 8-19, slender, plumose. *Fruit* a capsule, with 8-19 valves and loculi; valves with 2 expanding-keels, with their wings reduced to membranous awn-like points; loculi roofed with membranous wings and their opening nearly closed by a large tubercle.

Very dwarf tufted succulent perennials; leaves opposite, 1-3 pairs to a growth, glaucous-green or white, dotted, the alternating pairs dissimilar in size, form, or the degree of union at their base, one pair being united for a greater length than the succeeding pair and, when withered, the united part forming a truncate sleeve-like sheath around the next pair; flower solitary, pedicellate, terminal from between a usually shorter and more united pair of leaves (bracts). (Type, *C. bifidum*, N. E. Br.).

Endemic; species several, found from Namaqualand southwards to the Laingsburg district.

2405j

26. DACTYLOPSIS, N. E. Br.

Calyx with a short tube above the ovary, 5-lobed above. *Petals* numerous, in several series, the inner (staminodes?) concealing the stamens, linear, stiff, united into a tube at the base and arising in the angle where the calyx joins the ovary. *Stamens* numerous, erect, in 4 series, arising from the tube of the corolla and not exerted from it. *Ovary* half-superior, 5-chambered; placentas on the central axis; style none; stigmas 5, subulate, acute. *Fruit* a globose capsule, with 5 grooved ridges on the top, and with 5 valves and loculi; each valve with 2 closely contiguous expanding-keels down the middle becoming free and diverging at their tips and with very broad marginal wings united in pairs between the valves; loculi without wings or tubercles. *Seeds* very small, compressed-ellipsoid.

Dwarf stemless succulent perennial, forming clumps; leaves 2 (rarely more) to a growth, alternate, stout, with large tubular sheaths closely clasping one another, soft and pulpy, dotless; flowers terminal, solitary, sessile. (Type *D. digitata*, N. E. Br.).

Endemic; species 1, found in the Van Rhynsdorp district.

2405k

27. ASPAZOMA, N. E. Br.

Calyx produced into a distinct tube above its union with the ovary, unequally 4-5-lobed above. *Petals* numerous, in 2-3-series, linear, apparently united into a short tube at the base. *Stamens* and staminodes numerous, erect, connivent?. *Ovary* conical at the top (probably half-superior, but too crushed to admit of examination), 4-5-chambered; placentas on the central axis; stigmas 4-5, subulate. *Fruit* not seen.

Succulent perennial, bushily branched, with distinct internodes; leaves alternate and opposite on the same branch, semi-terete or sub-trigonal, always with a tubular sheath nearly or quite as long as the internodes; flowers terminal, solitary. (Type, *A. amplexans*, N. E. Br.).

Endemic; species 1, found in Little Namaqualand and Van Rhynsdorp.

2405l

28. AMOEBOPHYLLUM, N. E. Br.

Calyx with a short tube above its union with the ovary, 5-lobed above. *Petals* numerous, narrowly linear, united at the base into a distinct tube, arising from the angle where the calyx unites with the ovary. *Stamens* numerous, in several series, arising from the corolla-tube; filaments short, apparently incurved. *Ovary* half or less than half-superior, 5-chambered; placentas axile; stigmas 5, short and stout. *Fruit* a capsule, half- or

apparently more than half-superior, with 5 valves and loculi ; only an immature specimen seen, in which each valve appears to have one central expanding-keel and a broad wing on each side ; the wings uniting in pairs between the valves.

Dwarf perennial bushy succulents, with stout erect branches papillate on the green parts ; leaves alternate, sessile, withering and persisting as spines or as a hardened fragment ; flowers in terminal cymes, pedicellate. (Type *A. angustum*, N. E. Br.).

Endemic ; species 3, found in Damaraland and Namaqualand.

2405m

29. SCELETIUM, N. E. Br.

Calyx with a short tube above its union with the ovary, 5-lobed above. *Petals* numerous, in several series, passing into staminodes, all united at the base into a short tube, arising where the calyx-tube unites with the ovary. *Stamens* numerous, connivent-erect, more or less concealed by the much longer staminodes. *Ovary* partly superior, 4-5-chambered ; placentas axile ; style none ; stigmas 4-5, sometimes, but not always, concealed under the stamens and staminodes. *Fruit* a capsule, half- or more than half- superior, with 4-5 valves and loculi ; valves with one stout acute expanding-keel down its centre ; loculi without wings or tubercles. *Seeds* compressed, orbicular-D-shaped.

Perennial succulent glabrous herbs, with prostrate branches ; leaves opposite, slightly united at the base, flat or much broader than thick, soft, minutely papillate, without dots, withering (always ?) to a skeleton and persisting ; flowers terminal, solitary or a few in a cyme. (Type *S. tortuosum*, N. E. Br.).

Endemic ; species 5, found in the Karroo.

2405n

30. CRYOPHYTUM, N. E. Br.

Calyx with a short tube above its junction with the ovary, 4-5-lobed above ; two of the lobes often large and leafy. *Petals* numerous, slender, linear-filiform, united at the base into a distinct tube. *Stamens* numerous, erect, arising from the corolla-tube. *Ovary* and capsule half- or more than half-superior, 5-chambered ; placentas axile ; style none ; stigmas 5, erect, filiform. *Fruit* a capsule, 5-valved ; valves with a central acute-edged expanding-keel and a broad erect or inflexed membranous wing on each margin ; loculi without wings or tubercles. *Seeds* small, compressed, somewhat D-shaped.

Annual prostrate herbs with distinct internodes, papillate ; leaves alternate on the flowering branches and opposite at the basal part, flat or undulated, much broader than thick, sessile or petiolate, covered with glittering papillæ ; flowers solitary and opposite the leaves, scattered along the branches, or in cymes. (Type *C. crystallinum*, N. E. Br.).

Species few, natives of South Africa and the Mediterranean region.

2405o

31. CARPANTHEA, N. E. Br.

Calyx 5-lobed down to the top of the ovary. *Petals* very numerous and slender, free or nearly so. *Stamens* very numerous, at first inflexed to the centre over the stigmas, afterwards spreading outwards and exposing the stigmas ; the outer hair-like, without anthers. *Ovary* inferior, broader than deep, 12-20-chambered ; placentas on the floor of the chambers ; style none ; stigmas 12-20, filiform, finely pointed. *Fruit* a capsule, much broader than deep, with 12-20 valves and loculi ; valves narrow, with a pair of closely contiguous expanding-keels ending in awns, but without marginal wings ; loculi not roofed, but with a very narrow space for the seeds to get out. *Seeds* small, compressed, roundish, not winged.

Annual succulent herb ; leaves opposite, flat, radical or at the lower part of the flowering branches ; pedicels longer than the leaves, erect, prostrate in fruit. (Type, *C. pomeridiana*, N. E. Br.).

Endemic ; species 1, apparently confined to the Cape district.

2405p

32. THYRASPERMA, N. E. Br.

Calyx 5-lobed down to its junction with the ovary ; lobes with leafy tips. *Petals* numerous, free. *Stamens* numerous. *Ovary* inferior, broader than deep, 1-chambered, but with imperfect partitions at the central part extending as slight ridges on the floor ; ovules at the base of the central axis on long funicles ; style none or very short ; stigmas 8-12, filiform. *Fruit* dry, flattened above and below, indehiscent, valveless, 1-locular. *Seeds* numerous, in a single whorl around the central axis, flat, broadly winged all round and perforated, or with a hyaline spot close to the body of the seed, which is honey-combed and toothed on one face.

Annual herbs ; leaves opposite, radical or at the lower part of the flowering branches, petiolate, flat ; flowers solitary ; pedicels long, erect, becoming prostrate in fruit. (Type, *T. helianthoides*, N. E. Br.).

Endemic ; species 2, ranging from Clanwilliam to the Cape.

2405q

33. HYMENOGYNE, Haw.

Calyx 5-lobed nearly or quite down to the top of the ovary. *Petals* numerous, free or nearly so. *Stamens* numerous. *Style* funnel-shaped, with 9-12 papilla-like stigmas on the surface of its rim. *Fruit* (and probably the ovary, which I have not been able to examine) 1-locular, circular, much broader than deep, indehiscent and valveless. *Seeds* numerous, in a single whorl around the central axis, large, flat, winged and perforated just as in *Thyrasperma*.

Annual herbs ; leaves opposite, radical or clustered at the ends of the prostrate or decumbent branches, flat, petiolate, with the petiole dilated into a sheath at the base, not connate ; flowers solitary ; pedicels long, erect, becoming prostrate in fruit. (Type, *H. glabra*, Haw.).

Endemic ; species 2, ranging from Clanwilliam to the Cape.

2405r

34. PHYLLOBOLUS, N. E. Br.

Calyx produced above the ovary into a very short tube, 5-lobed above. *Petals* numerous, narrowly linear, united at the base into a short tube. *Stamens* numerous, in several series arising from the corolla-tube. *Stigmas* 5, erect. *Ovary* half-superior, 5-chambered ; placentas axile. *Fruit* unknown.

Stemless perennials ; rootstock thick and fleshy, divided into very short branches at the top, leafless for part of the year ; leaves 10-20 together, crowded into small radical rosettes, alternate, terete, with a flattened or sheath-like base, papillate ; flowers solitary, sub-sessile or shortly pedicellate. (Type *P. Pearsonii*, N. E. Br.).

Endemic ; species 2, found in Little Namaqualand and Laingsburg.

2405s

35. FENESTRARIA, N. E. Br.

Calyx 5-lobed down to its junction with the ovary. *Petals* many, in one series, free, linear. *Stamens* numerous, erect, lax ; staminodes 0. *Ovary* nearly superior, 10-11-chambered ; placentas on the floor and outer wall of the chambers ; style none ; stigmas 10-11, radiately spreading, very plumose. *Fruit* unknown.

Very dwarf stemless succulent perennials ; leaves clustered, erect, club-shaped, truncate at the apex and there destitute of chlorophyll ; flowers solitary, terminal, pedunculate, bracteate. (Type, *F. aurantiaca*, N. E. Br.).

Endemic ; species 3, found in Damaraland and Namaqualand.

2405t

36. FRITHIA, N. E. Br.

Calyx with a short green tube above its junction with the ovary, 5-lobed above. *Petals* numerous, in several series, linear, the innermost smaller (staminodes?), all united at the base into a distinct tube. *Stamens* in about 3-series, erect, arising from the corolla-tube and apparently concealed by the inner petals (or staminodes?). *Ovary* inferior, 5-chambered; placentas on the outer wall of the chambers; style none; stigmas 5, minute, stout, acute. *Fruit* unknown.

A very small stemless perennial herb; leaves 5-7 to a plant or growth, in a radical tuft, succulent, erect, clavate, sub-terete, truncate and without chlorophyll at the apex; flowers sessile or sub-sessile among the leaves, solitary. (Type, *F. pulchra*, N. E. Br.).

Endemic; species 1, known only from the Rustenburg district of the Transvaal.

2405u

37. CONICOSIA, N. E. Br.

Calyx 5-lobed down to its union with the ovary. *Petals* very numerous, in several series, free, linear, often ciliate at the basal part. *Staminodes* numerous, filiform, more or less incurved. *Stamens* very numerous, at first incurved around or over the stigmas, finally spreading outwards. *Ovary* with its top rising into a short cone, 10-20-chambered; placentas on the outer wall of the chambers; style none; stigmas 10-20, filiform. *Fruit* a capsule, dry, with the conical top separating into 10-20 narrow valves without expanding-keels, standing erect or with recurved tips, not spreading outwards when wetted, each with a pair of thin sub-membranous wings on the inner face. *Seeds* rather large for the group, sub-globose or somewhat lenticular, slightly keeled at the margin but not winged.

Succulent biennials or perennials, either with fibrous roots and a single main stem bearing a permanent dense tuft of leaves, or a fleshy tuberous root-stock and a radical tuft of leaves dying to the ground annually; flowering branches produced at the base of the leaf-tuft; leaves alternate, tufted, sessile or slightly stem-clasping, long and narrow, terete, or flat, or slightly channelled above and keeled or rounded on the back, soft, dotless; flowers large, solitary on long bractless pedicels. (Type, *C. pugioniformis*, N. E. Br.).

Endemic; species 6-8, ranging from Clanwilliam to the Cape.

2405v

38. CEPHALOPHYLLUM, Haw.

Calyx 5-lobed down to its union with the ovary. *Petals* numerous, free, linear. *Stamens* numerous, erect, not collected into a column. *Ovary* inferior, 15-20-chambered, with the top raised into a crater-like rim encircling the base of the stigmas, or perhaps sometimes merely depressed at the centre; placentas on the floor of the chambers; style none; stigmas 15-20, plumose. *Fruit* not seen ripe.

Dwarf succulent perennials; main stem short or very short, producing decumbent or prostrate branches with distinct internodes between some of the leaf-pairs; leaves opposite, crowded into a tuft on the main stem and ends of the branches, elongated, sub-terete or 3-angled, with more or less convex sides, minutely dotted; flowers solitary, terminal, on long bractless pedicels. (Type, *C. tricolorum*, N. E. Br.).

Endemic; species few, natives of the Karroo region.

2405w

39. PSILOCAULON, N. E. Br.

Calyx 4-5-lobed almost down to its union with the ovary, or with a very short tube above that union. *Petals* numerous, linear, united at the base into a tube, which is sometimes very short. *Stamens* numerous, erect. *Ovary*

half-superior, 4-5-chambered; placentas axile; style none; stigmas 4-5, filiform. *Fruit* a capsule, half-superior, with 4-5 valves and loculi; valves with the expanding-keels closely contiguous into one central keel and their margins with membranous wings inflexed upon the keel; loculi without wings or tubercles. *Seeds* compressed, somewhat D-shaped or obtusely triangular in outline.

Much branched succulent perennials, often erect bushes, but sometimes decumbent; branches continuous or jointed, with distinct internodes; leaves opposite, sessile, free or very slightly united at the base, small, slender, semiterete or terete, withering and deciduous, often leaving naked branches; flowers small, terminal in cymes, or solitary on lateral branches. (Type, *P. articulatum*, N. E. Br.).

Species numerous, natives of tropical and South Africa.

2405x

40. TRICHOCYCLUS, N. E. Br.

Calyx 5-lobed down to its union with the ovary. *Petals* numerous, linear, united below into a distinct tube. *Stamens* numerous, erect. *Ovary* half-superior, 5-chambered; placentas axile; stigmas 5, free or united into a very short style at the base, filiform, finely pointed. *Fruit* a capsule, with 5 valves and loculi; each valve either with a pair of free pocket-like appendages formed of two membranous wings folded together, or with a central keel and a wing from each margin of the valve folded upon it; loculi without wings or tubercles. *Seeds* small, slightly compressed, not flat nor winged.

Dwarf bushy succulent perennials; leaves opposite, short, united at the base into a sheath around the stem and there bearing a ring of deflexed hairs or cilia encircling the stem; flowers terminal, sometimes becoming lateral, solitary or in small cymes. (Type, *T. ciliatus*, N. E. Br.).

Endemic; species 5, ranging from Namaqualand to the Ceres district.

2405y

41. EREPSIA, N. E. Br.

Calyx produced above its union with the ovary into a short tube more or less thickened within at the apex, 5-lobed above. *Petals* free, arising from the top of the calyx-tube, linear. *Staminodes* numerous, some inflexed and more or less concealing the stamens, and arising with the petals. *Stamens* many, arising from the inner surface or at the top of the calyx-tube, all inflexed (not erect). *Ovary* inferior, flat or slightly convex on the top, 5-6-chambered; placentas on the outer wall of the chambers; style none; stigmas 5-6, very small, stout, obtuse. *Fruit* a capsule, sharply 2-edged, with 5 valves and loculi; each valve with a pair of distant expanding-keels ending in broad awn-pointed membranes; loculi roofed with stiff wings, but without tubercles at the openings.

Perennial succulent shrublets; branches with distinct internodes, 2-edged; leaves opposite, very slightly or scarcely united at the base, laterally compressed and acutely 3-angled, dilated and scabrid or serrulate at the upper part of the keel; flowers solitary, at first terminal, becoming lateral, not bracteate. (Type, *M. inclaudentis*, Haw.).

Endemic; species 4.

2405z

42. PIQUETIA, N. E. Br.

Calyx 5-lobed, with the tube above its union with the ovary spread out into a broad and shallow saucer-shaped limb or cup. *Petals* lax, with small elliptic blades and long slender stalks, united at the base with the staminodes and stamens into a solid ring around the top of saucer-like calyx-cup.

Staminodes and *stamens* numerous, and together with a few inflexed petals all closely contiguous and connivent into a dome covering the centre of the flower, at first quite concealing the stigmas, afterwards separating so as to leave 4-5 slit-like openings in the dome; stamens abruptly inflexed, with the anthers pendulous. *Ovary* inferior, concave at the top, 8-10-chambered; placentas on the outer wall of the chambers; stigmas 8-10, about 1 line long, broad, flattened, obtuse and minutely branched, radiating closely upon the top of the ovary in a star-like manner. *Fruit* a capsule, with 8-10 valves and loculi; valves with the expanding-keels contiguous below, diverging above, ending in awn-like points, without wings; loculi roofed with flexible membranous wings, but without tubercles at the openings. *Seeds* compressed-sub-globose.

Perennial succulent shrub, with distinct internodes; leaves opposite, sub-equal, slightly united at the base, laterally compressed, 3-angled, dotted. (Type, *P. Pillansii*, N. E. Br.).

Endemic; species 1, known only from the Piquetberg district.

2405za

43. CARPOBROTUS, N. E. Br.

Calyx 5-lobed down to its union with the ovary. *Petals* numerous, free. *Stamens* numerous, erect. *Ovary* inferior, 10-16-chambered; placentas on the outer wall of the chambers; style none; stigmas 10-16, radiating, plumose. *Fruit* fleshy or pulpy, indehiscent and without valves, 10-16-locular. *Seeds* obovoid, slightly compressed, on long funicles.

Perennial succulents, with trailing stems having distinct internodes; leaves opposite, slightly united at the base, sharply 3-angled; flowers large, terminal, solitary. (Type, *C. edulis*, N. E. Br.).

Species few, natives of the coastal region of South Africa, and perhaps also of Chili and Australia.

56. PORTULACACEÆ.

Flowers bisexual, rarely unisexual. *Sepals* 2, imbricate, herbaceous, more rarely rigid, deciduous or more rarely sub-persistent, usually free, more rarely adnate to the base of the ovary. *Petals* 5, more rarely 4 or 6, hypogynous or perigynous, ephemeral, fugacious, or persistent, sometimes accrescent. *Stamens* 5 to many, hypogynous, more rarely perigynous; staminodes sometimes present. *Ovary* superior, very rarely half-inferior, 1-chambered, with a solitary basal ovule, or ovules many on a free-central placenta; style 2-8-fid. *Fruit* normally a capsule, rarely indehiscent, splitting into 3-6 valves or dehiscing transversely about the middle. *Seeds* sub-globose or compressed, shining, often granulated, with or without an appendage; embryo more or less curved; endosperm present.

Herbs or undershrubs, very rarely small trees; leaves alternate, opposite or sub-opposite, more rarely verticillate; stipules present or absent; inflorescence a cyme, arranged in racemes or panicles, or flowers solitary or in small fascicles or in racemes.

Genera 18; species about 200, natives of Asia, Africa, Madagascar, America, Australia, New Zealand.

1. Sepals adnate to base of ovary; ovary half-inferior; fruit dehiscing transversely 5. *Portulaca*, Linn.
- Sepals free; ovary superior; fruit indehiscent or splitting into valves 2

2. Ovules many 3
 Ovule solitary 4
 3. Stipules 0 ; flowers in racemose or paniced cymes, rarely solitary
 1. Talinum, Linn.
 Stipules membranous ; flowers in simple racemes, sometimes on long
 peduncles **2. Anacampseros, Linn.**
 4. Flowers bisexual ; flowers fascicled, usually in groups of 3 on
 shortened terminal leafless branchlets . . . **3. Portulacaria, Jacq.**
 Flowers unisexual, rarely bisexual, in fascicles or axillary racemes
 4. Ceraria, Pearson & Stephens

2406

1. TALINUM, Adans.

Sepals 2, herbaceous, ovate, deciduous or rarely sub-persistent. *Petals* 5, hypogynous, ephemeral. *Stamens* 5-8, adhering to the base of the petals. *Ovary* superior, with many ovules ; style 3-fid or 3-furrowed at the apex. *Fruit* a capsule, globose or ovoid, chartaceous, 3-valved. *Seeds* sub-globose or laterally compressed, sub-reniform, shining, with the funicle expanded into an appendage.

Herbs or undershrubs, fleshy, glabrous ; leaves alternate or sub-opposite, flat ; stipules 0 ; inflorescence a terminal racemose or paniced cyme, rarely flowers solitary, axillary or lateral.

Species about 35, natives of Asia, Africa, and America ; 1 species in South Africa, found in the north-western districts, the Orange Free State, and the Transvaal ; absent from Natal, but recorded in the east from Komgha.

2412

2. ANACAMPSEROS, Linn.

Sepals 2, rigid or sub-herbaceous. *Petals* 5, hypogynous, very fugacious. *Stamens* many, adhering to the base of the petals. *Ovary* superior, with many ovules ; style 3-fid. *Fruit* a capsule, oblong, 3-valved, with the valves often longitudinally divided and then apparently 6-valved. *Seeds* angled or laterally compressed, 3-winged or nude.

Low herbs or undershrubs ; leaves alternate, ovate or lanceolate, fleshy, sometimes very minute ; stipules membranous, larger than the leaves, or forming hair-like sub-scarious fascicles in the axils of the leaves ; flowers sessile, involucreted, or on elongated racemose peduncles ; bracts opposite, scarious.

Endemic ; species 17, typically of the central districts, but also found in S.W. Africa and in the coastal belt from Riversdale to Uitenhage.

2419

3. PORTULACARIA, Jacq.

Sepals 2, membranous, persistent. *Petals* 4-5, hypogynous, equal, obovate, persistent. *Stamens* 5-7 (perhaps 10, of which 3-5 are abortive), inserted with the petals ; anthers short, often barren. *Ovary* superior, 3-angled, with a single ovule ; style very short ; stigmas 3, slightly spreading, muciculate-glandular above. *Fruit* a capsule, 3-angled, 3-winged, indehiscent.

Glabrous shrubs ; leaves opposite, obovate, fleshy ; flowers small, fascicled in groups usually of 3 on shortened terminal leafless branchlets.

Endemic ; species 2, typically of the Karroo, but extend in the coastal belt from Riversdale to Natal.

2419a

4. CERARIA, Pearson & Stephens

Flowers unisexual, single flowers very rarely bisexual. *Sepals* 2, short, persistent. *Petals* 5, longer than the sepals, hypogynous, free, at length accrescent. *Stamens* in male flowers 5 ; in the female flowers reduced

to linear staminodes or very rarely with abortive anthers. *Ovary* in male and female flowers 3-angled, flattened, with a single basal ovule; style 0 or very short; stigma 2-3-fid. *Fruit* (immature) compressed, asymmetrical, membranous, with a single wing, tightly surrounded by the accrescent corolla; in scarcely mature fruits (seen in 1 species) fleshy, wingless and surrounded at the base by the accrescent corolla.

Small trees, shrubs, or shrublets; leaves very few, in pairs or fascicled, small, fleshy, flat or terete; flowers small, in fascicles or axillary racemes.

Endemic; species 3, known only from S.W. Africa.

2421

5. PORTULACA, Linn.

Sepals 2, adnate at the base to the ovary, deciduous. *Petals* 4-6, free, inserted at the base of the sepals. *Stamens* 8 to many, inserted at the base of the petals and with them perigynous. *Ovary* semi-inferior, with many ovules; style deeply 3-8-fid. *Fruit* a capsule, membranous, dehiscent transversely about the middle. *Seeds* laterally compressed, reniform, shining, often granulated.

Diffuse or ascending fleshy herbs; leaves alternate or sub-opposite, flat or terete; stipules scarious or reduced to fascicles of setæ; flowers terminal, sessile or pedicelled.

Species about 63, found in all warm regions of the world; 5 species in South Africa; a genus of the Karroo and north-western districts, also recorded from the Transvaal and Basutoland and in the coastal belt from Natal to Riversdale.

57. BASELLACEÆ.

Flowers bisexual. *Sepals* 2, adnate to the corolla at the base. *Corolla* 5-cleft or 5-partite, imbricate in bud, persistent. *Stamens* 5, opposite the corolla-lobes and adhering to them at the base; filaments straight or bent outwards in the bud; anthers very often versatile. *Ovary* superior, 1-chambered, with a single basal ovule; style 3-partite. *Fruit* indehiscent. *Seed* with endosperm; embryo curved or spirally twisted.

Glabrous twining herbs; leaves alternate, broad, entire; inflorescence a spike, raceme, or panicle; bracts 2.

Genera 5, with about 14 species, natives of Asia, Columbia, South America, and tropical America.

2427

1. BOUSSINGAULTIA, H. B. & K.

Sepals 2, adnate to the corolla at the base. *Corolla* membranous or fleshy; tube short; lobes 5, oblong, obtuse, concave, spreading. *Stamens* 5, inserted in the throat of the corolla-tube; filaments filiform-subulate; anthers oblong, versatile, included. *Ovary* ovoid, with a boss at the apex, thickly stalked. *Seed* erect, sub-reniform. *Embryo* semi-annular; endosperm starchy.

Glabrous twining herbs; leaves alternate, petioled or sub-sessile, ovate, elliptic, or cordate, thick or fleshy, entire; flowers in axillary and terminal simple racemes, or the branches laxly or densely flowered; bracts at base of pedicel persistent or deciduous.

Species 10, natives of tropical America; 1 species naturalised in South Africa.

58. CARYOPHYLLACEÆ.

Flowers bisexual, very rarely unisexual. *Perianth* a single whorl, or consisting of sepals and petals. *Sepals* usually 5, more rarely 4, free, connate at the base, or high up to form a distinct calyx-tube. *Petals* usually 5, more rarely 4, rarely 0, entire, bifid, notched, or deeply cut, with or without claws, with or without scales at the base of the lamina. *Stamens* usually 5 or 10, sometimes less; staminodes sometimes present. *Hypogynous disc*, when present, annular or glandular. *Ovary* superior, 1-chambered, more rarely incompletely 2-3-chambered below the middle, with 1 to many ovules; styles distinct or united at the base and 2-3-fid above. *Fruit* a capsule, splitting into as many valves as there are styles, or in the genera with a single perianth, a utricle or nut usually enclosed in the persistent perianth. *Seeds* usually compressed, margined or winged; embryo annular or hooked, more rarely straight; endosperm present.

Annual or perennial herbs, very rarely woody at the base, or undershrubs, often dichotomously branched, tufted or erect; leaves opposite, alternate, or whorled; stipules present or 0; inflorescence often cymose, with the cymes racemose or panicle, or an axillary or terminal cyme or cluster, sometimes a dichotomous cyme, more rarely flowers solitary.

Genera 79, with about 1,225 described species, mostly natives of the north temperate Zone.

Tribe **Alsineæ**: Sepals free or connate at the base; petals and stamens on a small torus, hypogynous or often very shortly perigynous; petals narrowed or obtuse at the base, never distinctly clawed or with scales; styles distinct (genera 1-6).

Tribe **Polycarpeæ**: Sepals free or connate at the base; petals of **Alsineæ**, often small or very small, with the stamens on a small torus, hypogynous or slightly perigynous; stamens 5 or fewer; styles united below, 3-, rarely 2-fid above (genera 7-9).

Tribe **Pollichieæ**: Petals 0; ovary 1-4-ovuled; embryo dorsal, straight or slightly curved, with an inferior radicle (genus 10).

Tribe **Paronychieæ**: Petals 0; ovary 1-ovuled; embryo annular; leaves opposite or rarely alternate (genera 11-12).

Tribe **Scleranthææ**: Petals 0; ovary 1-2-ovuled; embryo annular; leaves opposite, connate at the base, exstipulate (genus 13).

Tribe **Sileneæ**: Sepals united to form a toothed or lobed calyx; petals and stamens hypogynous, with the ovary on a short gynophore or rarely sessile; petals with scales at the base of the lamina or naked; styles distinct from the base; stipules 0 (genera 14-17).

- | | |
|---|------------------------|
| 1. One perianth whorl only present; ovules 1-2 | 2 |
| Sepals and petals present, rarely petals 0; ovules many, rarely only 3 | 5 |
| 2. Stamens 1-2; ovules 2; stigmas 2, minute | 10. Pollichia, Soland. |
| Stamens usually 5; ovule solitary; styles 2, distinct or united below, with 2-3 stigmas | 3 |
| 3. Leaves opposite, connate at the base | 13. Scleranthus, Linn. |
| Leaves opposite, alternate, or falsely whorled, not connate at the base | 4 |
| 4. Stigmas 3 | 11. Corrigiola, Linn. |
| Stigmas 2 | 12. Herniaria, Linn. |
| 5. Sepals free or connate at the base | 6 |
| Sepals united to form a toothed or lobed calyx | 14 |
| 6. Styles distinct | 7 |
| Styles united below, 2-3-fid above | 12 |
| 7. Leaves with scarious or membranous stipules | 8 |
| Stipules absent | 9 |
| 8. Styles 5 | 5. Spergula, Linn. |
| Styles 3 | 6. Spergularia, Pers. |
| 9. Inflorescence a panicle of cymes or a head, rarely flowers axillary and sub-solitary | 10 |
| Inflorescence terminal, consisting of cymes arranged dichotomously | 2. Cerastium, Linn. |

10. Petals 2-fid, or cut, or distinctly emarginate 1. *Stellaria*, Linn.
 Petals entire, obscurely notched, rarely 0 11
11. Tufted plants, with subulate leaves connate at the base; styles as many as the sepals 3. *Sagina*, Linn.
 Usually erect plants with subulate or small leaves, it diffuse or tufted then leaves broad; styles usually fewer than the sepals 4. *Arenaria*, Linn.
12. Petals deeply 2-4-lobed or -partite 7. *Drymaria*, Willd.
 Petals entire, 2-toothed, emarginate, with the margins shortly toothed 13
13. Sepals keeled; inflorescence a number of crowded bracteate cymes 8. *Polycarpon*, Loeffl.
 Sepals not keeled; inflorescence cymose; cymes lax or contracted and head-like 9. *Polycarpæa*, Lam.
14. Calyx 5-10-nerved; styles 3 or 5, very rarely 2 15
 Calyx many-ribbed; styles 2 16
15. Calyx with foliaceous teeth; styles opposite the petals 14. *Agrostemma*, Linn.
 Calyx-teeth not foliaceous; styles alternating with the petals 15. *Silene*, Linn.
16. Calyx without an involucre of bracts 16. *Vaccaria*, Medik.
 Calyx 2 to several, bracteate at the base 17. *Dianthus*, Linn.

2429

1. STELLARIA, Linn.

Sepals 5, very rarely 4. *Petals* 4-5, 2-fid, or variously cut, or only emarginate. *Stamens* 10, or by abortion fewer, hypogynous or slightly perigynous. *Disc* annular, sometimes scarcely conspicuous, sometimes more or less expanded into prominent glands between the stamens. *Ovary* 1-chambered, with many (rarely 3) ovules; styles 3, rarely 2 or 4, very rarely 5 and then alternating with the sepals. *Fruit* a capsule, globose, ovoid, or oblong, splitting below the middle into as many simple or 2-fid valves as there are styles. *Seeds* compressed, granulate; embryo annular.

Slender herbs, usually glabrous, tufted or laxly ascending; leaves opposite, narrow or broad; inflorescence a panicle of cymes, or rarely flowers axillary.

Species about 100, widely dispersed; one or two species found naturalised in South Africa and widely distributed.

2430

2. CERASTIUM, Linn.

Sepals 5, rarely 4. *Petals* 4-5, rarely 0, notched or 2-fid, rarely quite entire or deeply cut. *Disc* of 5 honeyed glands. *Stamens* 10, 5, or fewer. *Ovary* 1-chambered, with many ovules; styles usually 3, when 5 then opposite the sepals. *Fruit* a capsule, cylindric, often incurved, with twice as many short terminal valves as styles. *Seeds* compressed, often tubercled; embryo annular.

Herbs, usually pubescent or hirsute, rarely glaucous; leaves opposite, various, but rarely subulate; inflorescence terminal, consisting of a number of cymes arranged dichotomously.

Species about 100, found in all temperate and cold regions; 4 species recorded from South Africa, but not all native; found chiefly in the eastern part of the Union, but generally distributed.

2433

3. SAGINA, Linn.

Sepals 4-6. *Petals* as many as the sepals, entire or slightly emarginate, sometimes very small, or 0. *Stamens* as many as the sepals, twice as many, or fewer by abortion. *Ovary* 1-chambered, with many ovules; styles as many as the sepals and alternating with them. *Fruit* a capsule, dehiscing to the base into as many valves as the styles.

Annual or perennial tufted herbs ; leaves opposite, subulate, connate at the base ; stipules 0 ; flowers solitary, small, often on long pedicels.

Species about 20, natives of the northern extra-tropical regions, South America, the Himalayas, and Africa : 1 species recorded from the Transvaal.

2443

4. ARENARIA, Linn.

Sepals 5. *Petals* 5, entire or slightly notched, rarely 0. *Stamens* 10, rarely 5, inserted on the disc. *Disc* annular, or of honeyed glands between the stamens. *Ovary* 1-chambered, with many, rarely few, ovules ; styles 3-4. *Fruit* a capsule, with as many entire or 2-fid valves as there are styles. *Seeds* compressed, smooth or tuberculated ; embryo annular.

Annual or perennial herbs, slender or rigid, with subulate or small leaves, rarely diffuse or tufted with broad leaves ; cauline leaves opposite ; inflorescence of panicle cymes, or a head, rarely flowers axillary and sub-solitary.

Species about 100, natives of temperate and cold regions ; 1 or 2 species found naturalised in South Africa.

2449

5. SPERGULA, Linn.

Sepals 5. *Petals* 5, entire. *Stamens* 5 or 10. *Ovary* 1-chambered, with many ovules ; styles 5, opposite the petals. *Fruit* a capsule, with 5 entire valves. *Seeds* compressed, margined or winged ; embryo annular.

Annual herbs, with forked or fascicled branches ; leaves opposite, subulate, with abbreviated leaf-buds in their axils, and thus appearing whorled ; stipules small, scarious ; inflorescence of cymes, arranged in racemes.

Weeds of cultivation in all temperate countries. Fairly widely distributed in South Africa.

2450

6. SPERGULARIA, Pers.

(*Lepigonum*, Fries.)

Sepals 5, *Petals* 5, entire, rarely 0. *Stamens* 2-10. *Ovary* 1-chambered, with many ovules ; styles 3. *Fruit* a 2-valved capsule. *Seeds* compressed, often winged ; embryo annular or hooked.

Diffuse herbs, with forked or fascicled branches ; leaves opposite, subulate, with abbreviated leaf-buds in their axils and thus appearing whorled ; stipules membranous, connate and surrounding the leaf-bases ; inflorescence of cymes arranged in racemes.

Species 3-4, found in temperate and warm regions ; found as a weed in South Africa.

2452

7. DRYMARIA, Willd.

Sepals 5, herbaceous, or the margins scarious. *Petals* 5, deeply 2-4-lobed or -partite. *Stamens* 5 or fewer, slightly perigynous. *Ovary* 1-chambered, with many ovules ; styles 3-fid. *Fruit* a 3-valved capsule. *Seeds* reniform-globose or compressed ; embryo coiled round the endosperm.

Diffuse, rarely erect, herbs, dichotomously branched ; leaves opposite, flat, broad or narrow ; stipules small, often fugacious ; flowers pedicelled, often small, in pairs, or inflorescence often a terminal or axillary cyme.

Species about 30, natives of tropical and sub-tropical America ; one species widely dispersed, and in South Africa recorded from Natal.

2453

8. POLYCARPON, Loeff.

Sepals 5, keeled, entire, with a scarious margin. *Petals* 5, small, hyaline, entire or emarginate. *Stamens* 3-5. *Ovary* 1-chambered, with many

ovules ; style short, 3-fid. *Fruit* a 3-valved capsule. *Seeds* ovoid ; embryo incurved or almost straight.

Diffuse or dichotomously branched herbs, glabrous or pubescent ; leaves flat, opposite or whorled ; stipules scarious ; inflorescence a crowded bracteate cyme ; flowers small.

Species about 6, found in all temperate and warm countries ; found as weeds of cultivation in South Africa.

2455

9. POLYCARPAEA, Lam.

Sepals 5, scarious or rarely herbaceous, not keeled and with the margin alone scarious. *Petals* 5, entire, 2-toothed, or rarely with the margins shortly toothed. *Stamens* 5, sub-perigynous, free, or cohering together and adnate with the petals to form a tube. *Ovary* 1-chambered, with numerous ovules ; style slender, 3-fid or toothed. *Fruit* a 3-valved capsule. *Seeds* obovoid or compressed ; embryo curved, rarely straight.

Erect annual or perennial herbs, rarely diffuse ; leaves narrow, linear or rarely ovate, opposite or appearing whorled from the presence of axillary fascicles of leaves ; stipules scarious ; inflorescence a number of lax or contracted or capitate cymes.

Species about 30, natives of warm climates ; 1 species recorded from the Transvaal and Natal.

2467

10. POLLICHIA, Soland.

Perianth herbaceous, urceolate, the mouth of the tube closed by a thickened lobed disc ; lobes ovate, short, erect or spreading. *Stamens* 1-2, inserted on the disc ; filaments very short ; anthers oblong. *Ovary* 1-chambered, with 2 basal ovules on short funicles ; style short, filiform ; stigmas 2, minute. *Fruit* a globose or ovoid-oblong 1-2-seeded utricle. *Seeds* oblong or ovoid ; embryo straight or slightly curved.

A dichotomously branched undershrub ; leaves opposite or in false whorls, lanceolate, acuminate ; stipules scarious, free ; inflorescence a number of sessile crowded axillary cymes, surrounded by white scarious bracts ; flowers minute, each subtended by a bracteole which becomes thick and fleshy ; the bracteoles conniving so as to present the appearance of a succulent berry open at the top.

A monotypic genus of the eastern districts, recorded from Uitenhage to Natal ; also from Queenstown, Albert, Basutoland and the Transvaal ; occurs also in tropical Africa.

2469

11. CORRIGIOLA, Linn.

Perianth herbaceous, 5-partite, persistent ; segments oblong, obtuse, muticous, with membranous margins. *Stamens* 5, perigynous ; filaments filiform ; staminodes 5, scale-like, alternating with the stamens. *Ovary* 1-chambered, with a solitary ovule on a basal funicle ; style very short ; stigmas 3. *Fruit* an indehiscent globose or ovoid-trigonus nut included in the perianth. *Seed* globose-ovoid ; embryo annular, surrounding the copious endosperm.

Annual or perennial herbs, rarely shrubby at the base ; leaves opposite and alternate, spatulate or linear ; stipules various ; inflorescence of axillary and terminal cymes, or flowers in clusters, minute ; bracts and bracteoles minute.

A cosmopolitan genus of 4-6-species ; 2 species recorded from South Africa, occurring in the north-eastern and eastern districts, also found in the Transvaal and extending in the coastal belt to the Cape.

2476

12. HERNIARIA, Linn.

Flowers sometimes unisexual. *Perianth* herbaceous, deeply 4-5-fid; tube short, turbinate; segments equal or unequal, obtuse, muticous. *Stamens* 3-5, perigynous, equal or unequal; filaments setaceous; staminodes 4-6, setaceous, minute, or 0. *Ovary* ovoid, 1-chambered, with a single ovule on a basal funicle; style very short; stigmas 2. *Fruit* an ovoid membranous utricle enclosed in the perianth. *Seed* lenticular, shining; embryo annular, surrounding the endosperm.

Annual or perennial herbs; leaves opposite, alternate, or fascicled; stipules small, scarious, entire or ciliate; flowers crowded in the leaf axils; bracts and bracteoles small.

A genus of 8-10 species, natives of central and southern Europe, N.W. India, and Africa; a single species recorded from South Africa.

2483

13. SCLERANTHUS, Linn.

Perianth herbaceous when young, becoming crustaceous with age, usually 5-lobed; tube campanulate. *Stamens* 1-10 (usually 5), inserted in the throat of the perianth-tube; filaments subulate; staminodes 0. *Ovary* ovoid, 1-chambered, with a single ovule on a basal funicle; styles 2, distinct, filiform, erect. *Fruit* a membranous utricle, included in the hardened perianth-tube. *Seed* lenticular; embryo annular, surrounding the endosperm.

Low rigid annual or perennial dichotomously branched herbs; leaves opposite, connate at the base, subulate, pungent; stipules 0; flowers in axillary and terminal sessile or pedunculate clusters; bracts 0.

A cosmopolitan genus of about 10 species, found in the Old World; a single species recorded from South Africa, found in the southern coast belt, the eastern part of the central region, and in the Transvaal.

2488

14. AGROSTEMMA, Linn.

Calyx coriaceous, with foliaceous teeth. *Petals* 5, with a narrow claw, entire, without scales at the base. *Stamens* 10, the 5 opposite the petals sometimes adnate to the claw. *Disc* columnar. *Ovary* 1-3-chambered below the middle, with many ovules; styles 5, opposite the petals. *Fruit* a capsule, 6- (rarely 3-) valved at the top. *Seed* with a marginal hilum; embryo annular or half-annular.

Annual or perennial herbs; leaves radical, spathulate; cauline leaves opposite, narrower; inflorescence a number of fascicled or paniced cymes.

Species 2, natives of the Mediterranean Region and widely dispersed; 1 species found in South Africa as a weed.

2490

15. SILENE, Linn.

Calyx inflated, 5-toothed, 10-nerved. *Petals* 5; claw narrow; blade entire or divided, with usually 2 scales at the base. *Stamens* 10, the 5 opposite the petals sometimes adnate to the claw. *Disc* columnar. *Ovary* 1-3-chambered below the middle, with many ovules; styles 3, rarely 2-5, opposite the sepals. *Fruit* a capsule, 6- (rarely 3-) valved at the top. *Seeds* with a marginal hilum; embryo annular or half-annular.

Annual or perennial erect tufted decumbent or diffuse-scandent herb; leaves opposite; inflorescence variously cymose, often cymes arranged in spikes or panicles, or flowers solitary.

Species about 300, natives of Europe, Asia, Africa, and America; about 12 species recorded from South Africa, widely distributed over the Union.

2501

16. VACCARIA, Medik.

Calyx pedicelled, without an involucre of bracts; tube somewhat inflated, 5-angled; lobes 5, very short. *Petals* 5, clawed, exceeding the calyx, without appendages. *Stamens* 10; filaments slender. *Ovary* 1-chambered, with many ovules; styles 2. *Fruit* a capsule, opening by 4 apical tooth-like valves. *Seeds* laterally attached; embryo slightly curved.

Annual caulescent herbs; leaves opposite, glabrous, glaucous, entire, clasping at the base; inflorescence a dichotomous cyme.

Species 3, natives of western Asia and Europe; 1 species found in the Transvaal as a weed.

2502

17. DIANTHUS, Linn.

Calyx sessile, surrounded at the base by 2 to several bracts; tube elongated, finely and equally striate; teeth 5. *Petals* 5, long-clawed; lamina entire, many-toothed or -fid, without appendages. *Stamens* 10. *Ovary* 1-chambered, with many ovules; styles 2. *Fruit* a cylindric oblong or rarely ovoid capsule, opening by 4, rarely tooth-like, valves. *Seeds* orbicular or ovate, flattened; embryo straight.

Herbs, often perennial, sometimes almost woody; leaves opposite, narrow, commonly grass-like; inflorescence a panicle of cymes, or flowers terminal, solitary, or glomerate.

Described species about 250, but probably not all of them specifically distinct; 17 species described from South Africa, widely distributed.

59. NYMPHÆACEÆ.

Flowers bisexual. *Sepals* 3-5. *Petals* 3-5 or many. *Stamens* 6 to many, free or sometimes connate at the base; anthers opening inwards by longitudinal slits. *Gynaecium* of 3 to many free carpels, or carpels united below into a many-chambered ovary; carpels with few or many ovules, with parietal placentation; stigmas as many as the carpels, peltate or decurrent. *Fruit* formed of the connate carpels, or of separate and indehiscent carpels, or of the enlarged turbinate flat-topped disc with the nut-like carpels sunk in its crown. *Seeds* naked or arilled; embryo enclosed in the enlarged amniotic sac; endosperm floury, or 0.

Aquatic perennial herbs, with submerged rhizomes; leaves usually floating, often peltate, with the margins involute in veneration; flowers usually floating, solitary on naked usually long scapes; floral-whorls all free, hypogynous or adnate to a fleshy disc that surrounds or envelops the carpels.

Genera 8, with about 35 species, very widely spread.

Tribe *Nymphææ*: *Sepals* 4-6; *petals* and *stamens* indefinite; carpels confluent with one another or with the disc into 1 ovary, with many ovules; seeds with endosperm.

2513

1. NYMPHÆA, Linn.

Sepals 4, adnate to the base of the disc. *Petals* in many rows; the inner successively transformed into stamens, all adnate to the disc; filaments petaloid; anthers small, linear. *Ovaries* many, in 1 series, sunk in the fleshy disc and with it forming a many-chambered ovary crowned by the connate radiating furrowed stigmas; ovules many. *Fruit* a spongy berry. *Seeds* minute, buried in pulp, enclosed in a scale-like fleshy aril.

Large aquatic herbs, with submerged creeping rootstocks; leaves floating, peltate; flowers large, solitary on a long scape, floating.

Species about 25, found throughout the world; 2 species in South Africa, widely spread.

60. CERATOPHYLLACEÆ.

Plants monoecious. *Perianth* herbaceous or sub-membranous, equal; segments 6-12. *Male flowers*: *Stamens* 10-20, crowded on a flat or convex torus; filaments very short; anthers linear-oblong, equalling the perianth, opening by longitudinal slits; connective produced beyond the thecae into a thick coloured usually 2- or 3-toothed appendage. *Female flowers*: *Ovary* superior, sessile, ovoid, 1-chambered, with a solitary pendulous ovule; style terminal, linear-subulate, persistent; stigma unilateral. *Fruit* leathery, indehiscent, ovoid or ellipsoid, tipped with the hardened style, sometimes with 2-4 spreading or reflexed spines at the base, wingless or surrounded by a narrow or broad leathery toothed wing, smooth or tuberculate. *Seed* with a thin coat; endosperm 0.

Aquatic herbs, with elongated leafy floating branches; leaves verticillate, 2-fid or dichotomously divided; segments linear or filiform, somewhat rigid, usually toothed; flowers axillary, solitary, very small, sessile, the male and female alternating at the nodes, or male at the lower and female at the upper.

Genus 1, with 1-2 (or 12?) species, found growing in fresh water in nearly all parts of the world.

2516

1. CERATOPHYLLUM, Linn.

Characters and distribution of the family; one species recorded from George and Natal.

61. RANUNCULACEÆ.

Flowers bisexual, more rarely with occasional unisexual flowers. *Sepals* 3 to many, often 5, hypogynous, free, commonly petaloid and deciduous, imbricate or valvate. *Petals* equalling the number of sepals or many, sometimes 0. *Stamens* many, often numerous and in many rows, hypogynous, free; anthers opening by longitudinal slits. *Gynaecium* of many, rarely solitary, carpels; carpels free or rarely sub-connate; ovary superior, with usually solitary ascending or pendulous ovules with a ventral or dorsal raphe, sometimes ovules many and horizontal; style simple, or 0. *Fruits* follicular, or baccate, or a bunch of dry achenes, 1 to several-seeded. *Seeds* without an aril; embryo straight; endosperm copious.

Genera 48, with about 1,660 species, found in nearly every part of the globe.

Tribe *Anemoneæ*: Ovaries with 1 ovule; fruit a bunch of dry achenes, very rarely baccate; leaves alternate; sepals imbricate; flowers subtended by an involucre of leaves remote from the calyx, the latter mostly coloured and persistent at flowering time; petals absent (genus 1).

Tribe *Ranunculaceæ*: Similar to above except flowers not subtended by an involucre of leaves; calyx mostly caducous; petals mostly present (genera 2, 5, 6).

Tribe *Clematidæ*: Ovaries with 1 ovule; fruit a bunch of dry achenes, very rarely baccate; leaves opposite; sepals induplicate-valvate or rarely partly imbricate; petals absent or represented by outer staminodes (genera 3-4).

- | | |
|--|-------------------------------|
| 1. Leaves opposite | 2 |
| Leaves radical, or alternate, or both | 3 |
| 2. Sepals valvate | 3. <i>Clematis</i> , Linn. |
| Sepals half-imbricate and half induplicate-valvate or wholly imbricate | 4. <i>Clematopsis</i> , Bojer |
| 3. Petals present | 4 |
| Petals absent | 5 |
| 4. Petals without a nectary; achenes fleshy or pulpy | 2. <i>Knowltonia</i> , Linn. |
| Petals with a nectary; achenes dry | 5. <i>Ranunculus</i> , Linn. |
| 5. Involucre of leaves present, but remote from the calyx | 1. <i>Anemone</i> , Linn. |
| Involucre of leaves absent | 6. <i>Thalictrum</i> , Linn. |

2541

1. ANEMONE, Linn.

Sepals 4-20, coloured, imbricate, deciduous. *Petals* 0. *Stamens* many, shorter than the sepals. *Carpels* many, each with a single pendulous ovule. *Fruits* a bunch of dry achenes, nude, acuminate, tailed with the persistent styles, or tails absent.

Perennial herbs; leaves alternate, radical, dissected or lobed; flowers terminal on a radical scape, subtended by an involucre of leaves remote from the calyx.

Species about 180, cosmopolitan; 5 species in South Africa, most of them found in the eastern districts and extend from Natal to the Cape; also recorded from the Transvaal and Basutoland.

2541a

2. KNOWLTONIA, Salisb.

Sepals 5, herbaceous, deciduous. *Petals* 5-16, conspicuous, without a nectary. *Stamens* many. *Carpels* many, with 1 pendulous ovule in each; style deciduous. *Fruits* a bunch of achenes, fleshy or pulpy.

Perennial herbs, with the habit of some species of *Umbelliferae*; leaves radical, ternately compound; cauline leaves 0 or reduced to bracts; flowers often in irregular umbels.

Endemic; species 10, mainly in the eastern districts and extending from Natal to the Cape; also found in the northern Transvaal.

2542

3. CLEMATIS, Linn.

Sepals 4 (rarely 5-8), petaloid, valvate. *Petals* 0, or shorter than the sepals and represented by outer staminodes. *Stamens* many. *Carpels* many, each with a single pendulous ovule. *Fruit* a bunch of dry achenes; achenes sessile or scarcely stalked, with hairy or feathery tails.

Stems woody, scandent; rarely undershrubs or herbaceous; leaves opposite, tripinnate and with many leaflets, or rarely simple; petiole often twining; flowers axillary or terminal, solitary, or inflorescence a panicle; bracteoles usually absent, rarely 2.

Species about 230, mostly in the temperate regions, rare in the tropics; 3 species in South Africa, widely distributed.

2542a

4. CLEMATOPSIS, Bojer

Characters of *Clematis* except that the sepals are half imbricate and half induplicate-valvate or wholly imbricate; leaves sometimes alternate in cultivation (*C. Stanleyi*, Hutch.).

Species 15, all natives of Africa and Madagascar; 1 species found in the Transvaal.

2546

5. RANUNCULUS, Linn.

Sepals 3-5, caducous. *Petals* of same number or more, usually with a single nectary at the base or on the claw. *Stamens* many, rarely few, shorter than the sepals and petals. *Carpels* many, in several series, with a single ascending ovule in each. *Fruits* a bunch of dry achenes, sometimes apiculate with the very short styles or rostrate, smooth, striate, ribbed, rugose, or spiny.

Annual, sometimes perennial herbs; leaves alternate, often radical, entire or cut; flowers solitary, or inflorescence a panicle, rarely flowers sessile in the axils of the branches.

Species about 300, cosmopolitan; about 6 species found in South Africa, in the eastern and north-eastern districts, but extending from Natal to the Cape; also recorded from the Transvaal, Basutoland, and the eastern Orange Free State.

2548

6. *THALICTRUM*, Linn.

Sepals 4-5, petaloid. *Petals* 0. *Stamens* many, shorter or longer than the sepals. *Carpels* many, with a single pendulous ovule in each; style deeiduous or 0. *Fruit* a bunch of dry achenes, often shortly stalked.

Perennial herbs; leaves alternate, ternately divided; cauline leaves when present, alternate; inflorescence a panicle or rarely a raceme.

Species about 100, found in both hemispheres except Australia, New Zealand and extra-tropical South America; about 4 species in South Africa, found from the eastern districts into Natal; also in the Transvaal, Basutoland and the Orange Free State, not recorded farther south than the Amatolas; one recorded from Kimberley, also from the Somerset East and Graaff Reinet districts.

62. *MENISPERMACEÆ*.

Plants dioecious. *Sepals* varying in number, often in 3 whorls, sometimes in 2 whorls, rarely reduced to 1, free or rarely joined, imbricate or rarely valvate, often the outer smaller than the inner. *Petals* various, often in 2 trinerous whorls, rarely in 2 whorls, sometimes reduced or 0, free or rarely joined, imbricate or valvate. *Stamens* many, or equalling the number of petals and opposite them, often 6, rarely 3, free or variously connate; anthers variously dehiscent. *Staminodes* in female flowers various, sometimes absent. *Carpels* free, rarely many, sometimes 6, very often 3, inserted on a short torus, rarely on a long gynophore, in the male flowers mostly absent, rarely rudimentary; style terminal or sub-terminal, often recurved; stigma entire, lobed, or cut; ovules often 2, generally 1, in each carpel. *Fruit* a number of free drupes; drupes sessile or stalked, straight or curved. *Seed* conforming in shape to the drupe, with a very thin membranous testa; embryo rarely straight, mostly curved; endosperm present or absent.

Usually woody climbers or scandent, sometimes with tendrils, rarely herbaceous, erect trees, shrubs or undershrubs; leaves alternate, petioled, penninerved or often palmatinerved, entire, rarely palmatilobed, very rarely compound; petiole at the base, and often at the apex, pseudo-articulated; stipules 0, very rarely present; inflorescence ultimately cymose, often arranged in racemes or panicles; the female simple; flowers mostly small, green, white, or yellow, very rarely deeply coloured.

Genera 63; species 357, found in all tropical countries.

Tribe *Cocculeæ*: Cotyledons not leafy, thick, fleshy (genera 1-4).

Tribe *Tinosporeæ*: Cotyledons thinly leafy (genus 5).

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|--|-------------------------------|
| 1. Carpels 3 | 2 |
| Carpel 1 | 3 |
| 2. Stamens free | 1. <i>Cocculus</i> , DC. |
| Stamens connate at the base or above the middle | 5. <i>Desmonema</i> , Miers |
| 3. Style 0; stigma obsolete or bluntly 2-lobed; in female flowers sepals | 2. <i>Stephania</i> , Lour. |
| 2 and petals 2 | 3. <i>Antizoma</i> , Miers |
| Style 3-partite; sepals and petals in female flowers 1 or 3-5 | 4 |
| 4. Sepals and petals in female flowers 3-5 | 2. <i>Stephania</i> , Lour. |
| Sepals and petals in female flowers 1 | 4. <i>Cissampelos</i> , Linn. |

2570

1. *COCCULUS*, DC.

Sepals often pilose; 3 outer smaller; 3 inner concave. *Petals* 6, concave or involute round the filaments, entire or bifid. *Male flowers*: *Stamens* 6-9, free; anthers with transverse dehiscence. *Female flowers*: *Staminodes* 6, filamentous or absent. *Carpels* 6 or 3, semi-ovoid; style cylindric, erect

or recurved. *Drupe* obovate or round and compressed, bearing the persistent style; endocarp keeled and tubercled. *Cotyledons* linear, flat; endosperm scanty.

Scandent shrubs, rarely prostrate or erect; stems sometimes fleshy; leaves sometimes cordate, rarely sub-peltate, sometimes falling before the flowers appear, mostly pilose beneath; cymes 1-2-nate in the axil of leaves or bracts, or axillary on leafless branches, rarely flowers solitary in the female.

Species 11, natives of North America, Africa, temperate and tropical Asia, India, and Australia; 1 species in South Africa, recorded from the Transvaal and British Bechuanaland.

2572

2. STEPHANIA, Lour.

(Homocnemia, Miers)

Male flowers: *Sepals* 6-8, mostly sub-equal, rarely unequal, concave, obovate. *Petals* 3-4, broadly obovate or sub-orbicular, rarely absent. *Stamens* united into a column bearing a flat disc, with the sessile anthers confluent into a single ring round the margin. *Female flowers*: Similar to those of the male, but *sepals* 3-6 and *petals* 2-4. *Carpel* 1; style almost absent; stigma very shortly lobed or divided into 3-6 spreading lobes. *Fruit* a drupe, compressed; endocarp horseshoe-shaped with an open cavity on each side. *Seed* curved; embryo conforming to the shape of the seed; endosperm scanty.

Scandent shrubs, rarely herbs; leaves peltate, with a variously shaped lamina; inflorescence mostly a simple or compound pseudo-umbel, rarely a panicle, with the ultimate cymes often many-flowered.

Species 32, natives of Africa, Asia, and Australia; 2 species in South Africa extending from the northern Transvaal into Basutoland and Natal, and as far south as the Port Elizabeth district.

2573

3. ANTIZOMA, Miers

Male flowers: *Sepals* 4, narrowly cuneate-obovate. *Petals* 4, connate into a saucer-shaped corolla. *Stamens* connate into a column, expanded and peltate above; anthers 4-10, sessile in a marginal ring on the disc of the staminal-column. *Female flowers*: *Sepals* 2, opposite, strongly concave, ovate, slightly imbricate. *Petals* 2, opposite the sepals, small, fleshy, sub-orbicular. *Carpel* 1; style 0; stigma lobed. *Fruit* a drupe; endocarp on either side with 3 small and somewhat conspicuous warty ridges.

Shrubs, scarcely scandent, often prostrate or sub-erect; branches often much abbreviated, more or less tomentose; leaves small, triangular, lanceolate or linear, rarely ovate-sub-orbicular; leaves of primary branches often armed at the base with a dorsal spur-like spine; male inflorescence in cymes; female flowers solitary or 2-nate.

Endemic; species 4, found in the Transvaal and S.W. Africa, extending into the Orange Free State, Bechuanaland, the north-western districts, Namaqualand, Clanwilliam, and into the south-western districts.

2574

4. CISSAMPELOS, Linn.

Male flowers: *Sepals* 4, mostly dorsally pilose. *Petals* connate into a cup or saucer-shaped corolla, very rarely 2-4 and free. *Stamens* connate into a column, expanded and peltate above; anthers sessile in a marginal ring on the disc of the staminal-column. *Female flowers*: *Sepal* 1, obovate, dorsally pilose. *Petal* 1 (rarely petals 2-3), opposite the sepal. *Carpel* 1, more or less villous; style 3-fid. *Fruit* a drupe, often pilose; endocarp often warty.

Scandent bushes, rarely erect shrubs ; leaves ovate, cordate, or suborbicular, sometimes peltate ; female inflorescence a number of cymes in a paniculate-corymb, sometimes in the axils of the foliage leaves, sometimes in the axils of reduced bracts ; female cymes few-flowered, in the axils of leaves or bracts.

Species 20, natives of tropical Asia, America, and Africa ; 4 species in South Africa, extending from the Transvaal and Natal through the coastal districts to Van Rhynsdorp ; also recorded from the Queenstown district.

2591

5. DESMONEMA, Miers

Male flowers : *Sepals* 6 ; the outer 3 minute, triangular-ovate ; the inner 3 much larger than the outer, flat, membranous. *Petals* 6 ; the outer 3 slightly shorter than the inner sepals, concave, with involute margins, fleshy ; the inner 3 smaller than the outer, boat-shaped or much folded (involute). *Stamens* 6 or 3 ; filaments connate to about the middle ; anthers erect, dehiscing by a lateral longitudinal slit. *Female flowers* : *Sepals* and *petals* similar to those of the male. *Carpels* 3 ; ovary obliquely ovoid ; stigma sessile, oblique. *Drupe*s 3 or fewer ; unequally ovoid ; endocarp with 5-6 teeth and with a deep cavity on the ventral side.

Scandent shrubs ; leaves entire, often cordate at the base, palmately 5-7-nerved ; male inflorescence a pseudo-raceme, slender, narrow, elongated ; flowers fascicled ; bracts acuminate.

Species 7, natives of Africa and Madagascar ; 1 species in South Africa, recorded from Natal.

63. ANONACEÆ.

Flowers bisexual, more rarely unisexual. *Sepals* 3, usually valvate, free or connate. *Petals* 6, hypogynous, in 2 rows, free or united, imbricate or valvate. *Stamens* hypogynous, 6 or more, usually numerous ; filaments short, or 0 ; anthers oblong ; connective produced into a variously shaped appendage. *Carpels* 1 or more, usually many, free, or more rarely uniting at the base to form a 1 to many-chambered ovary ; ovules solitary or many ; style short or 0 ; stigma various. *Fruit* of 1 to many sessile or stalked carpels, 1 to many seeded, usually fleshy, or rarely dehiscent, more rarely the carpels fusing with the torus to form a fleshy false-fruit (a syncarp). *Seeds* large, more or less flattened, usually shining ; embryo small ; endosperm dense.

Trees, shrubs, or lianes ; leaves alternate, simple, entire ; flowers solitary or in fascicles.

Genera about 95, with about 1,150 species ; almost all tropical plants.

Tribe *Uvarieæ* : Carpels free or, if united, forming a many-chambered syncarp ; stigmas erect ; petals always in 2 rows, both, or only the inner row, imbricate ; leaves usually with stellate or lepidote indumentum (genus 1).

Tribe *Unoneæ* : As above, but petals all valvate, either in 2 distinct rows or rarely in 1 row, usually 6, rarely 4, more rarely 3, in the latter case either the inner or the outer row missing ; the outer petals as large as or larger than the inner and distinct from the sepals (genera 2-4).

- | | |
|---|-----------------------------|
| 1. Ovules many in each carpel | 2 |
| Ovules 1-2 in each carpel | 3 |
| 2. Stigmas truncate, with the margin rolled inwards all round | 1. <i>Uvaria</i> , Linn. |
| Stigma 2-lobed, with the lobes oblong or dilated | 3. <i>Hexalobus</i> , A.DC. |
| 3. Carpels free in the fruit | 4 |
| Carpels fused with the torus to form a fleshy syncarp | 5. <i>Anona</i> , Linn. |
| 4. Flowers sub-globose on rather slender pedicels | 2. <i>Popowia</i> , Endl. |
| Flowers fascicled on flattened recurved woody peduncles | |
| | 4. <i>Artabotrys</i> , R.Br |

2673

1. UVARIA, Linn.

Sepals 3, valvate, often connate at the base. *Petals* 6, imbricate, in 2 rows, lanceolate-orbicular or ovate, sometimes connate at the base; the inner petals without glands at the base. *Stamens* indefinite, with an ovoid-oblong or truncate appendage. *Torus* flat or depressed, pubescent, often densely tomentose between the ovaries. *Carpels* free, indefinite, linear-oblong, with many ovules in 2 (rarely 1) rows; styles short and thick; stigmas truncate, with the margin rolled inwards all round. *Fruits* cylindric, smooth, few or many-seeded.

Climbing or trailing shrubs, with stellate pubescence; flowers terminal, opposite the leaves or rarely axillary, solitary, or inflorescence a cyme.

Species 110, natives of tropical Asia and Australia and a few African; 1 species in Natal.

2691

2. POPOWIA, Endl.

(*Guatteria caffra*, Sond. of the "Flora Capensis.")

Flowers bisexual or occasionally unisexual. *Sepals* 3, ovate, valvate. *Petals* 6, valvate, in 2 series, ovate or orbicular; the outer a little longer than the sepals, spreading; the inner thick, with the tip sometimes inflexed, a little longer than the outer. *Stamens* indefinite or definite, short, cuneate; anther-thecae dorsal, remote; appendages usually broad and flat. *Carpels* about 6, ovoid, with 1-2 ovules on the ventral suture, rarely with 1 basal ovule; style large, oblong, straight or curved. *Fruits* berry-like, globose or ovoid, stalked.

Trees or shrubs; flowers small, sub-globular, hardly opening, extra-axillary or opposite the leaves, nearly sessile, tomentose.

Species 55, natives of the Old World tropics; 1 species in South Africa, extending from Natal to East London.

2716

3. HEXALOBUS, A.DC.

Sepals 3, ovate, coriaceous, valvate. *Petals* 5, in 2 rows, connate at the base into a short tube, free above, sub-equal, valvate, transversely folded, at least in bud. *Stamens* indefinite; anthers linear or linear-cuneate, with the connective thickened and truncate above the thecae. *Receptacle* more or less convex or truncate. *Gynacium* of many free carpels (3-12); ovaries with numerous ovules in 1 row; stigma 2-lobed, with the lobes oblong or dilated. *Fruit* of as many separate parts as there were carpels; each portion fleshy.

Trees or shrubs, glabrous or pubescent; flowers axillary, solitary or fascicled, sessile or pedicelled.

Species 4, natives of Africa and Madagascar; 1 species found in the northern Transvaal.

2724

4. ARTABOTRYS, R.Br.

Sepals 3, valvate. *Petals* 6, valvate, in 2 series, concave and connivent at the base; limb lanceolate or sub-terete, generally narrow. *Stamens* many, oblong or cuneate; appendages short or long; anther-thecae dorsal. *Carpels* few or many, with 2 erect ovules in each; style oblong or columnar. *Fruit* baccate.

Climbing or trailing shrubs; leaves coriaceous, usually small, dark green, shining; flowers solitary, or more often fascicled on flattened woody recurved peduncles by which the plant climbs.

Species 50, natives of the tropics and sub-tropics of the Old World; 1 species found in Natal.

2729

5. ANONA, Linn.

Sepals 3, valvate. *Petals* 6, valvate, in 2 series; the inner opposite the sepals or calyx-lobes, rarely absent; the outer fleshy or thick and coriaceous. *Stamens* indefinite; filaments short; anther-thecae parallel, opening by longitudinal slits; connective usually terminating in a swollen head or hood-like process above the anther-thecae. *Torus* convex or conical. *Carpels* many, usually free, sometimes united, usually hairy, with a single basal ovule in each; styles and stigmas free and various in form. *Fruit* fleshy, formed by the growing together of the carpels and the torus, usually ovoid, spheroid, or cordiform in shape.

A tropical genus of 65 species, mostly American, but a few African; 1 species found in the northern Transvaal, Swaziland and Natal.

64. MONIMIACEÆ.

Flowers bisexual or unisexual. *Perianth* regular or irregular, 4- or more-lobed or oblique; tube globose. *Disc* adnate to the perianth-tube. *Stamens* indefinite, in two or more rows; filaments usually flat, often with a gland on each side of the base; anthers erect, with 2 distinct thecae, or the thecae confluent at the apex, dehiscing longitudinally or by valves. *Carpels* distinct, usually many, more or less immersed in the disc, with a solitary erect or pendulous ovule in each; style long or short; stigma terminal. *Fruit* indehiscent, included in the enlarged perianth-tube. *Seed* solitary; testa membranous; endosperm fleshy or oily.

Trees or shrubs, leaves opposite or alternate, entire or toothed, penninerved; stipules 0; inflorescence a raceme or cyme, or the flowers fascicled; bracts small or 0.

Genera about 22, with about 150 species, widely dispersed in the warmer regions of both hemispheres.

2759a

XYMALOS, Baill.

Plants dioecious. *Male flowers* with a 4-6-parted perianth. *Stamens* 10-15; anthers 2-theous. *Ovary rudiment* 0. *Female flowers* with a 3-5-lobed perianth. *Staminodes* 0, or represented by a ring of hairs round the base of the ovary. *Ovary* obovoid or turbinate, 1-chambered, with a solitary pendulous ovule; stigma sessile, discoid or sub-hemispherical, wider than the top of the ovary. *Fruit* fleshy, smooth, crowned by the persistent stigma. *Seed* compressed, ellipsoid.

Shrubs or small trees; leaves nearly opposite, shortly petioled, minutely pellucid-punctate; inflorescence a solitary raceme, or racemes geminate in the axils of the leaves, hairy; bracts ovate or oblong.

A tropical African genus of 3 species; 1 species in South Africa, extending from the northern Transvaal and Natal to King Williamstown, (*Xymalos monospora*, Baill *Xylosma monospora* Harv.)

65. LAURACEÆ.

Plants sometimes dioecious. *Flowers* bisexual, sometimes with occasional unisexual flowers, regular. *Perianth* usually 6-lobed; tube (receptacle) ovoid, turbinate, campanulate, or rarely oblong, sometimes growing out and persisting after flowering; lobes equal or more or less unequal, in 2 whorls, or the perianth divided almost to the base into 6 equal or sub-equal segments. *Stamens* typically in 4 whorls at the base of and

opposite to the perianth-lobes, or in the upper part of the receptacle, often one or the other (usually the fourth) whorl reduced to staminodes or entirely suppressed; filaments usually present, varying from very short to several times the length of the anthers, the filament of the third whorl mostly with a pair of large globose glands at the sides or at the base or behind them; anthers 2-4-valved, with introse or extrose dehiscence. *Ovary* superior, more or less surrounded by the receptacle or ultimately quite enclosed in it, very rarely inferior, 1-chambered, with a solitary anatropous pendulous ovule. *Fruit* fleshy, indehiscent, more or less surrounded by, or entirely free, or enclosed in the persistent and enlarged perianth. *Seed* pendulous; endosperm none.

Trees or shrubs, very rarely twining parasitic herbs (*Cassytha*), all parts with aromatic oil glands; leaves alternate, rarely opposite, penninerved or digitately 3-5-nerved, very rarely reduced to small scales (*Cassytha*); stipules 0; inflorescence cymose or racemose, axillary or sub-terminal, rarely terminal, or rarely flowers solitary; bracts caducous or sub-persistent, sometimes forming involucres below the partial inflorescence; bracteoles 0 (except in *Cassytha*).

Genera about 34, with about 1,000 species, found in the tropics and sub-tropical regions; few in Africa.

1. Twining parasites, without chlorophyll, and leaves reduced to scales

3. *Cassytha*, Linn.

Trees or shrubs, with well developed leaves 2

2. Anthers 2-valved; fruit completely enclosed in the persistent and accrescent receptacle 2. *Cryptocarya*, R.Br.

Anthers 4-valved; fruit seated on or in the enlarged cupular receptacle 1. *Ocotea*, Aubl.

2788

1. OCOTEA, Aubl.

Plants usually dioecious. *Flowers* sometimes bisexual. *Perianth* herbaceous, 6- or 8-lobed or -partite, with or without a receptacle or tube; lobes or segments equal, usually deciduous. *Bisexual flowers* with the stamens in 3 or 4 whorls; the outer 3 whorls fertile; the fourth whorl (if present) staminodial; filaments very short or 0, or longer than the anthers; those of the third whorl with a sessile, very rarely stipitate, gland at each side of the base; anthers 4-valved; anthers of the 2 outer whorls introse; anthers of the third whorl extrose or sub-extrose, very rarely introse; staminodes, if present, slender. *Ovary* ovoid, ellipsoid, or sub-globose, usually glabrous; style longer or shorter than the ovary. *Male flowers* as in the bisexual flowers, but the ovary sterile, stalk-like or quite suppressed. *Female flowers* as in the bisexual flowers, but the stamens rudimentary, barren. *Fruit* baccate, ellipsoid or globose, seated on or in an enlarged cupular receptacle, which is either truncate or 6-toothed or -lobed from the persistent perianth-lobes.

Trees or shrubs; leaves alternate, membranous or coriaceous, glabrous or hairy; inflorescence cymose or racemose, arranged in axillary or sub-terminal panicles.

Species about 200, mostly found in tropical America, 1 in tropical Africa, a few in the Mascarene Islands; 1 species in South Africa, extending from the northern Transvaal and Natal to Swellendam; with a wide gap in the eastern districts.

2813

2. CRYPTOCARYA, R. Br.

Flowers bisexual. *Perianth* herbaceous, 6-lobed; lobes in 2 whorls, sub-equal, deciduous; receptacle ovoid to turbinate or sub-cylindric, constricted above after flowering, persistent. *Stamens* in 4 whorls; the 2 outer whorls fertile and inserted at the base of the perianth-lobes; the

third whorl fertile and inserted in the upper part of the receptacle ; the fourth whorl similar to the third, but reduced to staminodes ; filaments short, those of the third whorl with a pair of sessile or stipitate glands at the base or in front of it ; anthers of the 2 outer whorls introse ; those of the third whorl extrose ; staminodes ovoid and shortly stipitate or attenuated at the base. *Ovary* sessile, enclosed in the receptacle ; style shortly exserted. *Fruit* globose or oblong, enclosed in the enlarged hardened or somewhat fleshy receptacle, smooth or longitudinally ribbed.

Trees or shrubs ; leaves alternate, rarely sub-opposite, penninerved or digitately 3-nerved, coriaceous ; inflorescence a sub-terminal or axillary panicle, rarely flowers solitary.

Over 40 species in the tropics, mostly natives of the Indo-Malayan region ; 6 species found in South Africa, mostly eastern, but extend from the northern Transvaal through the coastal belt to Van Rhynsdorp ; the distribution however not continuous.

2825

3. CASSYTHA, Linn.

Flowers bisexual, sometimes dimorphic. *Perianth* 6-partite ; receptacle turbinate or ovoid, tightly constricted above after flowering ; segments unequal ; the 3 outer segments much smaller than the 3 inner. *Stamens* 12, in 4 whorls of 3 each ; the 3 outer whorls fertile ; the fourth whorl staminodial, rarely also the second whorl reduced to staminodes ; filaments of the third whorl with sub-sessile glands at each side of the base ; anthers 2-theous ; those of the 2 outer whorls introse ; those of the third whorl extrose ; staminodes sub-sessile or stipitate. *Ovary*, during flowering, hardly immersed in the receptacle, which afterwards grows out and envelops it. *Fruit* completely enclosed in the succulent receptacle, often crowned by the persistent perianth-limb.

Twining parasitic herbs, without chlorophyll, adhering to their hosts by means of uniseriate haustoria ; leaves reduced to minute scales ; inflorescence a raceme, spike, or head ; flowers small, sessile or pedicelled from the axils of scale-like bracts, supported by a pair of bracteoles.

Species about 16, mostly Australian ; 3 species in South Africa, extending through the coastal belt from Natal to the Cape.

66. HERNANDIACEÆ.

Plants sometimes dioecious. *Flowers* bisexual, or unisexual, or bisexual with occasional unisexual flowers. *Perianth-lobes* 4-10, valvate or imbricate. *Stamens* inserted at the base of the perianth-tube, alternating with glands or staminodes ; fertile stamens 3-5, alternating with the inner perianth-segments ; filaments straight ; anthers 2-theous, opening by valves. *Ovary* inferior, 1-chambered, with 1 pendulous inverted ovule ; style and stigma simple. *Fruit* winged, terete, angled, sometimes fleshy. *Seed* without endosperm.

Trees or shrubs ; leaves alternate ; stipules 0 ; inflorescence usually a cyme arranged in racemes or panicles.

Genera 4, with about 21 species, natives of America, Africa, India, and the Malay Archipelago.

2830

1. GYROCARPUS, Jacq.

Flowers unisexual. *Male flowers* : *Perianth* 4-7-partite ; lobes equal or unequal, oblong-spathulate, obtuse, imbricate. *Stamens* 4-7, inserted deep in the perianth, alternating with staminodes ; anthers broadly oblong. *Ovary* 0. *Female or bisexual flowers* : *Perianth-tube* ovoid ; lobes of

limb 2, oblong, obtuse, persistent, enlarging in the fruit. *Stamens* 0. *Ovary* 1-chambered, with a solitary ovule pendulous from the apex of the chamber; style 0; stigmas sessile between the lobes of the perianth. *Fruit* a bony nut, produced into 2 wings. *Seed* broadly oblong.

Tall trees, with the branches leafy at the apex; leaves alternate, long-petioled, entire or lobed; inflorescence a dense racemose cyme; flowers small, hairy; male flowers very numerous; female flowers solitary or few in each cyme; bracts 0.

Species 1, found in all tropical countries; recorded from S. W. Africa.

67. PAPAVERACEÆ.

Flowers bisexual, regular. *Sepals* 2, rarely 3, free, deciduous. *Petals* 4-6, flat, spreading, all similar, rarely wanting. *Stamens* hypogynous, indefinite, free, adhering in parcels to the base of the petals; filaments slender; anthers 2-theous, basifixed, erect, opening lengthwise. *Ovary* superior, 1-chambered, with numerous ovules on parietal placentas; style short or none; stigmas as many as the placentas, radiating. *Fruit* a dry capsule, rarely a berry, dehiscent or indehiscent. *Seeds* numerous; embryo minute; endosperm copious, usually oily.

Herbs, rarely shrubs, with coloured narcotic juice; leaves alternate, simple or multifid; stipules 0; flowers usually solitary on long peduncles, white, red, or yellow, rarely inflorescence a panicle.

Genera 23, with over 100 species, chiefly natives of the northern hemisphere; common throughout the temperate zone.

- | | |
|---|----------------------------|
| Leaf-segments tipped with a bristle-like spine; flower-bud erect; | |
| petals white or yellow | 1. <i>Argemone</i> , Linn. |
| Leaf-segments not tipped with bristles; flower-bud drooping; | |
| petals brick-red | 2. <i>Papaver</i> , Linn. |

2852

1. ARGEMONE, Linn.

Sepals 2-3, hooded or horned. *Petals* 4-6, broadened upwards. *Stamens* numerous; filaments slender. *Ovary* with 4-6 nerviform placentas, with numerous ovules; stigma sessile, depressed, with the lobes spreading or recurved. *Fruit* a capsule, slightly elongated, opening at the top by 4-6 valves. *Seeds* numerous, sub-globose, pitted, not crested; embryo minute, basal.

Annual or biennial herbs, with glaucous foliage and a yellow sap; leaves alternate, sessile or clasping at the base, incised, pinnatifid, with the segments tipped with bristle-like spines; flowers showy, white or yellow; buds erect.

An American genus of 17 species; one species naturalised in South Africa and widely distributed over the Union.

2853

2. PAPAVER, Linn.

Sepals 2, rarely 3. *Petals* 4, rarely 5, broadened upwards. *Stamens* numerous; filaments slender. *Ovary* with 4-20 septiform placentas and with numerous ovules; stigmas united with a disc-like or variously shaped crown-like body. *Fruit* a sub-globose to oblong capsule, opening by 4-20 pores or cracks under the stigma. *Seeds* naked, without a crest.

Annual or perennial glaucous or pubescent herbs, with milky sap; leaves alternate, sometimes mostly basal, usually lobed or cut; flowers showy, variously coloured, on elongated peduncles; buds drooping.

Species about 140, natives of Europe, temperate Asia, Australia, and Africa; one species naturalised in South Africa.

68. FUMARIACEÆ.

Flowers bisexual, actinomorphic or zygomorphic. *Sepals* 2, scale-like, deciduous. *Petals* 4, in 2 rows, one or both of the outer pair saccate at the base; the inner pair callous and hooded at the apex, where they cohere and enclose the anthers and stigma, rarely petals almost similar. *Stamens* 4, free and opposite the petals, or stamens 6 and united into 2 bundles, each bundle being opposite the outer petals. *Ovary* superior, 1-chambered, with 1 or many parietal ovules; style filiform. *Fruit* a 1-seeded nut, or a 2-valved many-seeded pod. *Seeds* often crested; embryo minute; albumen copious, fleshy.

Herbs with fibrous or tuberous roots; stems weak, prostrate or scandent, more or less succulent; leaves alternate, rarely sub-opposite, much divided or more rarely pinnate, with the common petiole often ending in a tendril; stipules 0; inflorescence usually a raceme; flowers small, white, pink, purple, or yellow.

Genera 18; species 64, most abundant in the north-temperate zone of the Old World, especially round the shores of the Mediterranean and in the Himalaya-Yunnan mountains, also found in America, Africa, India, the Malay Islands, and Australia.

Tribe *Corydaleæ*: Fruit usually dehiscent; ovules 2 or more (genera 1-2).

Tribe *Fumariæ*: Fruit indehiscent, 1-seeded; ovule solitary (genera 3-5).

- | | |
|---|---|
| 1. Ovules 2 or more | 2 |
| Ovule solitary | 3 |
| 2. Capsule compressed, lanceolate | 1. <i>Phacocapnos</i> , Bernh. |
| Capsule bladder-like | 2. <i>Cysticapnos</i> , Boerh. |
| 3. Fruit asymmetrical, winged on one side | 5. <i>Trigonocapnos</i> , Schltr. |
| Fruit symmetrical | 4 |
| 4. Fruit a more or less turgid nut | 3. <i>Fumaria</i> , Tourn. |
| Fruit flattened, more or less discoid | 4. <i>Discocapnos</i> , Cham. & Schlecht. |

2858a

1. PHACOCAPNOS, Bernh.

(*Corydalis*, DC. of the "Flora Capensis.")

Petals 4; the posterior petal spurred at the base. *Stamens* 6. *Ovary* with many ovules. *Fruit* a capsule, compressed, lanceolate; valves separating from a persistent replum. *Seeds* numerous, lenticular, beaked, without an arillus.

Herbaceous annuals; leaves much cut, furnished with tendrils.

Endemic; species 3, extending from the Van Rhynsdorp and Clanwilliam districts through the coastal belt to Natal.

2858b

2. CYSTICAPNOS, Boerh.

Petals 4; the posterior petal spurred at the base. *Stamens* 6. *Ovary* with many ovules. *Fruit* a capsule, bladder-like, globose. *Seeds* compressed, beaked, shining.

A succulent climbing herb; leaves much cut, furnished with tendrils.

Endemic; species 1, extending from Namaqualand to the Cape.

2861

3. FUMARIA, Tourn.

Petals 4; the posterior petal spurred at the base. *Stamens* 6. *Ovary* with a solitary ovule. *Fruit* a sub-globose nut, symmetrical.

Herbaceous annuals; leaves much cut.

Species 46, natives of Europe, north Africa, and temperate Asia; found in South Africa as a weed of cultivation.

2861a

4. DISCOCAPNOS, Cham. & Schlecht.

Petals 4; the posterior petal spurred at the base. *Stamens* 6. *Ovary* with a solitary ovule. *Fruit* symmetrical, indehiscent, flattened and discoid, tipped with the base of the style. *Seed* beaked, shining.

A herbaceous annual; leaves much cut, furnished with tendrils.

Endemic; species 2, recorded from the Cape and Knysna.

2862

5. TRIGONOCAPNOS, Schltr.

Petals 4; the lateral petals produced into a claw at the base. *Stamens* 6. *Ovary* with a solitary ovule. *Fruit* asymmetrical, winged on one side.

An annual herb, scandent, leaves 2-3-pinnate, furnished with tendrils.

Endemic; species 1, recorded from the Clanwilliam district.

69. CRUCIFERÆ.

Flowers bisexual, regular or radial. *Sepals* 4, free, with the lateral sepals often saccate or spurred at the base. *Petals* 4, rarely 0, spreading, entire, bilobed, or very rarely lobulate or fimbriate, often long clawed. *Stamens* normally 6, of which 4 are longer, very rarely many or 2-4; filaments subulate, often toothed at the base and usually glandular at the base; anthers 2-theccous, rarely 1-theccous, opening by longitudinal slits. *Ovary* sessile or rarely stalked, superior, usually 2-chambered, owing to the presence of a replum, rarely 1-chambered or transversely septate, very rarely 3-chambered, with 1 to many ovules on 1-2 parietal placentas, rarely with a single basal ovule; style simple, or sometimes dilated or horned under the stigma; stigmas 1-2. *Fruit* elongated (a *siliqua*) or short (a *silicula*), 2-locular; or 1-locular by the disappearance of the septum, very often 2-valved, sometimes indehiscent, with 1 to many seeds. *Seeds* various, often winged; endosperm 0; embryo curved, rarely straight; cotyledons usually accumbent or incumbent.

Annual, biennial, or perennial herbs, rarely undershrubs, glabrous or hairy, with the hairs simple stellate or attached at the middle; leaves simple, very rarely compound, alternate, rarely opposite, often basal, entire, lobed, or much cut, frequently auricled at the base; stipules 0; inflorescence usually a terminal raceme, rarely racemes axillary, very rarely flowers solitary; bracts rarely present.

Genera over 200, with more than 2,200 described species, many of which are probably not valid, mostly massed in southern Europe and Asia Minor.

Series A. Fruit elongated or short, longitudinally dehiscent for the whole of its length; valves continuous, rarely septate, flat or convex, not compressed transversely to the septum; septum as broad as the valves.

Tribe *Arabideæ*: Fruit narrow, elongated; seeds very often in 1 row; cotyledons accumbent (genera 15-17, 19-21, 24).

Tribe *Abyssineæ*: Fruit very often short, broad, with the seeds in 2 rows; cotyledons accumbent (genera 22-23).

Tribe *Sisymbrieæ*: Fruit narrow, elongated, with the seeds very often in 1 row; cotyledons incumbent, straight, convolute or transversely folded (genera 1, 6, 9).

Tribe *Brassicæ*: Fruit longitudinally dehiscent for its whole length or the apex alone indehiscent, short or elongated; septum as broad as the valves; cotyledons longitudinally conduplicate (genera 10-13).

Series B. Fruit short, longitudinally dehiscent for its whole length; valves continuous within, strongly concave, compressed transversely to the septum; septum very often narrow.

Tribe *Lepidineæ*: Cotyledons incumbent, straight, incurved, or longitudinally conduplicate or convolute (genera 3, 7, 8, 18).

Series C. Fruit short, very rarely elongate, indehiscent, inarticulate, often crustaceous or bony, winged or wingless, 1-locular, 1-seeded, very rarely 2-seeded or 2-4-locular with the loculi parallel and 1-seeded; pedicels often slender, decurved in the fruit; seed often with a mucilaginous testa.

Tribe **Isatideæ**: Characters of the series (genera 4-5).

Series D. Fruit elongated, not jointed, indehiscent, terete or moniliform, 1-locular, many-seeded, or many-locular, with the loculi in 1-2 rows, 1-seeded.

Tribe **Raphanææ**: Characters of the series (genera 2, 14).

1. Fruit at least 4 times as long as broad 2
- Fruit less than 4 times as long as broad, or broader than long 19
2. Leaves trifoliate, on long petioles 17. *Cardamine*, *Linn.*
 Leaves simple, entire or variously cut 3
3. Lower leaves opposite; upper leaves petioled, with a cordate blade
 6. *Chamira*, *Thunb.*
 Leaves all alternate, often radical 4
4. Fruits with a sword-shaped beak 5
 Fruits with a conical or subulate beak, or beakless or almost so, or
 tipped with the persistent style 6
5. Fruit-valves with a single strong longitudinal nerve; seeds in 2 rows
 10. *Eruca*, *Linn.*
 Fruit-valves with 3 longitudinal nerves; seeds in 1 row 11. *Sinapis*, *Linn.*
6. Fruit compressed, elliptic, membranous, 1-locular, 1-seeded
 23. *Schlechteria*, *Bolus*
 Fruit compressed or terete, usually linear, 2-locular, with few to many
 seeds 7
7. Fruit tapering at each end, constricted between the seeds; the seeds
 separated by transverse partitions 2. *Carponema*, *E. & Z.*
 Fruit not tapering at each end, rarely constricted and septate 8
8. Fruit with a distinct conical or subulate beak besides the persistent
 style, terete or 4-angled 9
 Fruit terete or compressed, not evidently beaked, or only tipped with
 the persistent style 11
9. Fruit dehiscent, except the beak; petals not veined with purple 10
 Fruit indehiscent; petals veined with purple 14. *Rhaphanus*, *Linn.*
10. Fruit compressed; seeds in 2 rows 12. *Diplotaxis*, *DC.*
 Fruit terete or 4-angled; seeds in 1 row 13. *Brassica*, *Linn.*
11. Valves of fruit flat 12
 Valves of fruit rounded 13
12. Lateral sepals not saccate; cotyledons incumbent 1. *Heliophila*, *Linn.*
 Lateral sepals saccate; cotyledons accumbent 21. *Arabis*, *Linn.*
13. Lateral sepals saccate at the base 24. *Matthiola*, *R.Br.*
 Sepals equal at the base, rarely sub-saccate 14
14. Cotyledons incumbent 15
 Cotyledons accumbent 17
15. Cotyledons folded 12. *Diplotaxis*, *DC.*
 Cotyledons not folded 16
16. Fruit-valves usually 3-nerved 9. *Sisymbrium*, *Linn.*
 Fruit-valves with a strong mid-rib 19. *Stenophragma*, *Celak.*
17. Fruit-valves with a faint mid-rib 16. *Nasturtium*, *R.Br.*
 Fruit-valves with a strong mid-rib or ribbed 18
18. Seeds in 1 row 15. *Barbarea*, *R.Br.*
 Seeds in 2 rows 20. *Turritis*, *Linn.*
19. Valves of fruit with strongly raised ridges radiating from the keeled
 centre 4. *Cycloptychis*, *E.Mey.*
 Valves without strongly raised ridges 20
20. Fruit 1-locular 5. *Palmstruckia*, *Sond.*
 Fruit 2-locular 21
21. Petals showy, about 6 times as long as the calyx 3. *Brachycarpæa*, *DC.*
 Petals as long as or a little longer than the calyx 22

22. Plants pubescent, hoary, stellate, or scaly; hairs all or some of them branched at the base 22. *Alyssum*, Linn.
 Plants glabrous, or with simple hairs 23
 23. Fruits didymous 8. *Coronopus*, Gaertn.
 Fruits not didymous 24
 24. Fruits cuneate at the base, notched above 18. *Capsella*, Medik.
 Fruits elliptic, not cuneate nor notched 7. *Lepidium*, Linn.

2875

1. HELIOPHILA, Linn.

Sepals equal at the base. *Lateral stamens* simple, or with a tooth at the base. *Siliqua* sessile, often pendulous or deflexed, stalked, dehiscent or sub-dehiscent, short or elongated, compressed, linear, oblong, or lanceolate, with the margins straight or sinuate; valves 1-3-nerved, flat, often membranous; septum hyaline; style short or elongated; stigma 2-lobed or discoid. *Seeds* many or few, more rarely solitary in each loculus, in 1-2 rows, often bordered with a wing; cotyledons transversely twice folded.

Herbs, annual or shrubby at the base, or branched under-shrubs, glabrous or pubescent; leaves entire, toothed, sinuate, or pinnatisect, sometimes much cut; flowers white, yellow, rosy, or sky-blue; inflorescence a raceme; bracts 0.

Endemic; species 111, chiefly massed in the south-western districts, but fairly widely distributed otherwise.

2876

2. CARPONEMA, E. & Z.

Sepals spreading, equal at the base. *Petals* obovate-oblong, with a cuneate claw. *Lateral stamens* toothed at the base. *Siliqua* sessile, pendulous, slender, linear, terete, tapering to each end, 2-locular, with one loculus smaller and empty, constricted between the seeds; septum very thin; valves hardened, without nerves; style conical; stigma obtuse. *Seeds* in 1 row, oblong, terete, emarginate, separated by transverse partitions; cotyledons transversely twice folded.

Annual herbs, glabrous or pilose; leaves elongate-linear; flowers blue or purplish, in elongated racemes; pedicels filiform, erect in flower.

Endemic; species 1, only known from the south-western districts.

2877

3. BRACHYCARPAEA, DC.

Sepals erect, equal at the base. *Petals* elongated. *Stamens* free, without teeth. *Silicula* didymous, indehiscent, 2-locular; valves ventricose, sub-erect, emarginate; septum very narrow; style very short; stigma inconspicuous, emarginate. *Seeds* solitary in each loculus, sub-globose; funicle short; cotyledons spirally convolute.

Perennial undershrubs, glabrous; leaves sessile, linear, entire; flowers large, yellow or purple, arranged in elongated racemes; pedicels somewhat long; bracts 0.

Endemic; species 2, ranging from Clanwilliam to Riversdale.

2878

4. CYCLOPTYCHIS, E. Mey.

Sepals sub-erect, 3-ribbed, equal at the base. *Petals* narrow. *Stamens* free, not toothed. *Silicula* erect, nut-like, compressed, orbicular-ovate, rostrate, 2-locular, 2-seeded; valves marked with strongly raised ridges radiating from the keeled centre; septum somewhat thick; style rigid, subulate, elongate; stigma minute. *Seeds* pendulous from the apex of each loculus by a very short funicle, orbicular, compressed.

Herbs or erect undershrubs, glabrous; leaves scattered, linear, sessile, entire; flowers remote, somewhat large, purple or rosy, arranged in a terminal elongated raceme; pedicels thickened upwards; bracts 0.

Endemic; species 2, only known from the south-western districts.

2879

5. PALMSTRUCKIA, Sond.

Flowers not seen. *Silicula* sessile, orbicular, plano-compressed, 1-locular, 1-seeded, indehiscent; valves somewhat flat, without nerves, veined. *Style* very short. *Seed* orbicular, compressed, with a marginal membranous wing; cotyledons linear, incumbent, transversely twice folded.

An erect glabrous herb; leaves remote, linear-filiform; inflorescence an elongated raceme; pedicels filiform; bracts 0.

Endemic; species 1, only found in the south-western districts.

2880

6. CHAMIRA, Thunb.

Lateral sepals saccate at the base. *Stamens* free, not toothed. *Siliqua* shortly stalked, oblong, compressed, with a subulate beak; valves somewhat flattened, striate, without nerves. *Seeds* few, in 1 row, ovate, compressed, immarginate, with a mucilaginous testa; cotyledons transversely 2-folded; radicle filiform.

Slender glabrous annual herbs; lower leaves opposite, sessile; upper leaves petioled, alternate, cordate; flowers small, white, in few-flowered racemes; bracts 0.

Endemic; species 1, recorded from the Malmesbury district.

2883

7. LEPIDIUM, Linn.

Sepals short, equal at the base. *Petals* 4, small or wanting. *Stamens* 6 (2-4 sometimes absent or malformed). *Silicula* oblong, ovate, obovate, or orbiculate, rarely sub-globose, mostly strongly laterally compressed, keeled, emarginate at the apex, sometimes winged; septum narrow, membranous; style 0 or filiform; stigma emarginate. *Seeds* solitary in each loculus, or very rarely 2, pendulous from the apex of the septum, compressed or sub-3-angled, immarginate; cotyledons in one species accumbent, in the rest 3-partite.

Herbs or undershrubs of various habit, glabrous or pubescent; leaves various; flowers small, white or mauve, in racemes; bracts 0.

Species almost 100, found in all temperate and warm countries; about 12 species in South Africa, widely distributed.

2884

8. CORONOPUS, Gaertn.

(*Senebiera*, Poir.)

Sepals 4, spreading, equal at the base. *Petals* 4, larger than the sepals. *Stamens* free, without teeth, sometimes only 2 or 4. *Silicula* didymous, laterally compressed, indehiscent, with 1 seed in each loculus; valves sub-globose, rugose or crested. *Stigma* sessile, barely lobed. *Cotyledons* long, linear, attenuated into the radicle, incumbent or conduplicate.

Annual or biennial herbs, branched from the base and with the branches diffusely spreading; leaves alternate, entire or pinnatisect; flowers small, white, rarely purplish, in short racemes opposite the leaves.

Species about 12, found in all sub-tropical countries; 5 species in South Africa, widely distributed.

2917

9. SISYMBRIUM, Linn.

Sepals 4, short or elongated, equal at the base or the lateral sub-saccate. *Petals* 4, often elongate and long-clawed. *Stamens* free, without teeth. *Siliqua* linear-elongate, terete or compressed, very often many-seeded, often constricted between the seeds; valves concave or convex, often 3-nerved; septum membranous, 2-nerved or without nerves; style very often somewhat short; stigma simple, or shortly 2-lobed, or sub-cupular. *Seeds* in 1 row in each loculus, more rarely in 2 rows, immarginate, often

oblong and somewhat terete, with a filiform free funicle ; cotyledons incumbent or oblique.

Annual or biennial herbs, glabrous, pilose or cano-tomentose ; radical leaves arranged in a stellate manner ; cauline leaves alternate, often amplexicaul, entire, lobed, pinnatifid or pinnatisect ; flowers sometimes white or rosy, more often yellow, in lax racemes, rarely axillary ; bracts usually 0.

A genus of 50 species, mostly natives of the northern hemisphere ; 8 species in South Africa, besides several introduced species, widely distributed.

2944

10. ERUCA, Tourn.

Sepals 4, erect, obscurely saccate at the base. *Petals* veined. *Stamens* free, without teeth. *Siliqua* closely adpressed to the axis, oval-oblong, turgid, somewhat terete, with a large seedless sword-like beak ; valves concave, with a strong longitudinal nerve ; septum membranous. *Stigma* simple. *Seeds* many, in 2-rows, globose, with free funicles ; cotyledons conduplicate.

Annual or biennial herbs, erect, branching ; leaves pinnatilobed ; flowers lilac or yellow, veined with violet, arranged in racemes ; pedicels slender ; bracts 0.

Species about 10, natives of the Mediterranean Region and western Asia ; 1 species naturalised in South Africa.

2945

11. SINAPIS, Linn.

Sepals 4, spreading. *Petals* 4, longer than the sepals. *Stamens* not toothed. *Siliqua* elongated, nearly terete, constricted between the seeds, often hispid, with numerous seeds, prolonged into a sword-like beak which sometimes contains 1 seed. *Style* persistent. *Seeds* thick or sub-globose, immarginate and wingless ; cotyledons conduplicate.

Annual or biennial herbs ; leaves alternate, lobed, or pinnatifid, rough-pubescent ; flowers mostly yellow, in racemes or panicles.

Species 5, natives of the Mediterranean Region and central Europe ; 1 or 2 species naturalised in South Africa.

2946

12. DIPLLOTAXIS, DC.

Sepals spreading, equal at the base, often hirsute. *Petals* not much larger than the sepals. *Stamens* free, without teeth. *Siliqua* linear-elongate, compressed, beakless, rarely beaked, with the beak 1-seeded ; valves 1-nerved ; septum membranous ; style often slender ; stigma terminal. *Seeds* many, sub-2-seriate, ovate or globose, immarginate, with a free setaceous funicle ; cotyledons incumbent, folded.

Annual or biennial branching herbs, leaves pinnatifid ; flowers yellow or purple, arranged in racemes.

Species about 20, natives of the Mediterranean Region and central Europe ; 1 species recorded from the Barkly West district.

2949

13. BRASSICA, Linn.

Sepals 4, sometimes equal at the base. *Petals* 4, long-clawed. *Stamens* 6, free, without teeth. *Siliqua* elongated, terete or 4-angled, prolonged into a conical indehiscent 1-seeded beak, with many seeds in each loculus ; valves 1-3-nerved. *Style* persistent ; stigma truncate or 2-lobed. *Seeds* in 1 row, often sub-globose, immarginate ; cotyledon conduplicate.

Annual, biennial, or perennial caulescent herbs ; leaves alternate, lobed or pinnatifid, or the upper ones nearly entire ; flowers bright yellow or white, arranged in racemes.

A genus of about 50 species, natives of the Mediterranean Region, central Europe, and central and eastern Asia ; 3 or 4 species naturalised in South Africa.

2950

14. RHAPHANUS, Linn.

Sepals 4; lateral ones sub-saccate at the base. *Petals* veiny, long-clawed. *Stamens* free, without teeth. *Siliqua* indehiscent, elongated, terete, continuous or constricted, smooth or ribbed, coriaceous, corky or spongy, with a long tapering pointed beak, continuous within or filled with pith separating the seeds; style slender; stigma emarginate. *Seeds* pendulous, globose; cotyledons conduplicate.

Annual or biennial herbs, glabrous or hispid; root often succulent; leaves lyrate-pinnate or pinnatifid; flowers white or yellow, veined with purple, on slender pedicels arranged in elongated terminal racemes, or the racemes opposite the leaves; bracts 0.

Species about 10, natives of the Mediterranean Region, Europe, and Asia; 1 or 2 species naturalised in South Africa.

2961

15. BARBAREA, R. Br.

Sepals 4, sub-erect, equal at the base. *Petals* clawed. *Stamens* 6, free, without teeth. *Glands* present round the base of the ovary. *Siliqua* elongated, compressed-4-angled, with many seeds in 1 row in each loculus; septum hyaline; valves ribbed or keeled; style short; stigma capitate or 2-lobed. *Seeds* oblong, immarginate, with a free funicle; cotyledons accumbent.

Herbs, biennial or perennial, erect, branched, with angled stems; leaves alternate, runcinate or sinuate-pinnatifid; flowers yellow, in racemes or panicles; bracts sometimes present.

Species 14, cosmopolitan; one species naturalised in South Africa (perhaps native in the south-western area).

2965

16. NASTURTIUM, R. Br.

Sepals short, spreading, equal at the base. *Petals* usually small, scarcely clawed, sometimes 0. *Stamens* 1-6. *Siliqua* short or elongated, terete or nearly so, rarely didymous; valves faintly 1-nerved; septum hyaline; style short, or slender and elongate; stigma simple or 2-lobed. *Seeds* in 2 rows, very rarely irregularly in 1 row, small, turgid, with a short free funicle; cotyledons accumbent.

Aquatic or terrestrial herbs, with erect or creeping stems; leaves alternate, toothed, lobed, or pinnately dissected, glabrous or pubescent, with simple hairs; flowers small, yellow or white, in terminal or axillary racemes; bracts sometimes present.

Species about 50, cosmopolitan; 2 species naturalised in South Africa.

2966

17. CARDAMINE, Linn.

Sepals 4, equal or nearly so at the base. *Petals* 4, long-clawed. *Stamens* 6 or rarely 4. *Siliqua* elongated, narrow, flattened, often erect; valves nerveless or nearly so, elastically opening at maturity; septum hyaline; style short or elongated; stigma capitate or 2-lobed. *Seeds* in 1 row, compressed, immarginate; cotyledons accumbent, one sometimes overlapping the radicle.

Annual or perennial herbs, with erect or weak and creeping stems; leaves alternate, sometimes opposite or in whorls of 3, entire or pinnatisect, (in the South African species on long petioles and trifoliate); flowers white, pink, or purple; inflorescence a raceme or panicle, erect or drooping; bracts 0.

Species about 50, found in temperate alpine and arctic regions; 1 species in South Africa, extending from the northern Transvaal through Natal and the coastal belt to Swellendam.

2986

18. CAPSELLA, Medik.

Sepals 4, spreading, equal at the base. *Petals* not much larger than the sepals. *Stamens* free, without teeth, *Silicula* elliptic, oblong or obcordate, strongly compressed, more or less deeply notched at the apex; valves boat-shaped, keeled; septum membranous; style short; stigma capitate. *Seeds* many in each loculus, immarginate, with the funicle free; cotyledons accumbent.

Annual herbs, often weak, glabrous or pilose, with branched stems; leaves radical, rosulate, entire or lobed, inflorescence a raceme; flowers small, white; pedicels slender.

Species 4, cosmopolitan; 1 species naturalised in South Africa.

2999

19. STENOPHRAGMA, Celak.

Characters of *Arabis*, but fruit valves more or less convex, with a strong mid-rib and seeds usually in 1 row, with incumbent radicles.

Species 10, natives of central Asia, central and northern Europe, and North America; naturalised in South Africa.

3000

20. TURRITIS, Linn.

Characters of *Arabis*, but fruit valves more or less convex, with a strong mid-rib and seeds in 2 rows, with accumbent radicles.

Species 5, cosmopolitan; 1 species in South Africa, recorded from the Wittebergen, Basutoland, and Somerset East.

3001

21. ARABIS, Linn.

Sepals 4, equal or nearly so at the base. *Petals* 4, entire or emarginate, often clawed. *Stamens* 6, free, without teeth. *Silique* elongated, flat, with a faint mid-rib; stigma capitate or 2-lobed. *Seeds* numerous, in 1 row, immarginate, margined or winged; radicle accumbent.

Annual or perennial herbs; leaves alternate, sometimes mainly basal, glabrous, glaucous, or pubescent with forked stellate or simple hairs, entire, toothed or pinnatifid; inflorescence a raceme; flowers white, pink, purple, or yellowish; bracts 0.

A genus of about 100 species, natives of north and south Europe, South America, central, north and eastern Asia; 1 species recorded from near Graaff-Reinet.

3006

22. ALYSSUM, Linn.

(*Lobularia*, Desv.)

Sepals somewhat short, erect or spreading, equal at the base. *Petals* somewhat short, entire or bifid. *Stamens* 5, rarely 4, without teeth, or some or all toothed, more rarely with 2 glands at the base. *Silicula* always short, but distinctly polymorphic, ovate, oblong, obovate, or elliptic, compressed or turgid, with 1-10 seeds in each loculus; valves flat, or concave in the centre and flat at the margin; septum membranous, entire or perforated; style short or elongate; stigma simple. *Seeds* flattened, with the funicle free or adnate to the septum; cotyledons accumbent.

Herbs or undershrubs, often rigid, pubescent, hoary, stellate, or scaly; leaves scattered or crowded at the base, entire, often linear; inflorescence a raceme; flowers white or yellow, often inconspicuous; bracts 0.

Species about 100, natives of the Mediterranean Region and central Europe; 2 species in South Africa, found in the south-western districts.

3008

23. SCHLECHTERIA, Bolus

Calyx coloured, petaloid, equal at the base. *Petals* large, obovate, clawed. *Stamens* free, without teeth. *Ovary* 3-chambered, with 1-2 ovules in each chamber; style short; stigma undivided, covered with dense papillæ. *Siliqua* membranous, elliptic, flat, compressed, very narrowly marginate, with reticulate venation, 1-locular by the disappearance of the septum, by abortion 1-seeded. *Seed* pendulous from the side of the loculus by a long funicle, sub-orbicular, compressed, not winged; embryo curved; cotyledons accumbent.

Erect shrublet; leaves alternate, entire, sessile; flowers rosy, in lax terminal racemes; bracts 0.

Endemic; species 1, only known from the Clanwilliam district.

3042

24. MATTHIOLA, R.Br.

Sepals erect; the 2 lateral saccate at the base. *Petals* long-clawed. *Siliqua* elongated, terete or compressed; septum thick, very minutely areolate; stigma thickened, 2-toothed. *Seeds* in 1 row, compressed, often margined, with a free funicle; cotyledons accumbent.

Herbs or undershrubs, stellately-tomentose; leaves oblong or linear, entire or sinuate; inflorescence a raceme; flowers white or purple, large; bracts none.

Species about 50, native of western and southern Europe, western Asia, and Africa; 1 species in South Africa, recorded from the eastern parts of the central region.

70. CAPPARIDACEÆ.

Plants very rarely dioecious. *Flowers* bisexual, very rarely unisexual. *Sepals* 4-8, free or variously connate, in 1-2 rows, imbricate or valvate. *Petals* 4, rarely 0, very rarely 5-8, sessile or clawed, imbricate or open, very rarely valvate. *Torus* short or elongate, sometimes disc-like or produced at the back into a horn or appendage, depressed, or on a long or short stalk, sometimes lining the base of the calyx, with the margin glandular or fimbriate. *Stamens* inserted at the base or apex of the torus, sub-erect, spreading or declinate, few or many; filaments free, or connate at the base with the long torus, or monadelphous. *Ovary* superior, sessile, or shortly stalked, or on a very long stalk, 1-chambered or 2-8-chambered by intrusion of the placentas, with many ovules on 1 to many parietal placentas, very rarely ovule solitary. *Fruit* a capsule or berry, very rarely a drupe. *Seeds* reniform; embryo curved; endosperm 0.

Herbs, shrubs, more rarely trees, glabrous, variously hairy or scaly; leaves alternate, very rarely opposite, simple or 1-5-foliate; stipules, when present, setaceous, herbaceous, or spinescent; flowers axillary, fascicled, or solitary, or inflorescence a terminal corymb or raceme.

Genera 40, with over 300 species, natives of warm and tropical countries.

Tribe **Cleomeæ**: Fruit a capsule, 1-locular, very often siliqua-like, rarely short or didymous; herbs often annual (genera 1-3).

Tribe **Cappareæ**: Fruit baccate or drupaceous; shrubs or trees (genera 4-8).

1. Herbs; fruit a capsule 2
- Woody plants; fruit a berry or drupe, indehiscent 4
2. Stamens inserted on a long slender androphore, usually 6

2. Gynandropsis, DC.

Stamens inserted on the short sub-globose or depressed receptacle 3

3. Stamens usually numerous or intermixed with staminodes

3. Polanisia, Rafin.

Stamens usually 4-8, all fertile 1. Cleome, Linn.

4. Sepals joined to form a distinct tube 5
 Sepals free, or connate at the base only 6
 5. Stamens about 10; gynophore very short; flowers in umbellate
 clusters 4. *Bachmannia*, Pax
 Stamens indefinite; gynophore long; flowers solitary, fascicled, or in
 terminal racemes or corymbs 8. *Mærua*, Forsk.
 6. Disc equalling the claw of the petals, trumpet-shaped or spatulate,
 with a tubular claw 7. *Cadaba*, Forsk.
 Disc annular or wanting 7
 7. Petals 4; stamens indefinite 5. *Capparis*, Linn.
 Petals 0; stamens 6-20 6. *Boscia*, Linn.

3082

1. CLEOME, Linn.

Sepals 4, spreading, persistent or deciduous. *Petals* 4, sessile or clawed. *Stamens* 4-8, usually 6, on a short sub-globose receptacle; filaments equal; anthers 2-theous. *Ovary* sessile or shortly stalked, with many ovules on 2 parietal placentas. *Fruit* an oblong or linear capsule, opening by 2 valves which separate from the seed-bearing placentas. *Seeds* reniform, usually rough.

Herbs, mostly annual; leaves simple or digitately 3-9-foliolate; flowers in terminal racemes.

Species about 156, found in all warm countries; 8 species in South Africa, extending from the northern Transvaal through Natal to Griqualand East and westwards through Basutoland, the Orange Free State to Namaqualand; also found in Bechuanaland.

3087

2. GYNANDROPSIS, DC.

Sepals 4, spreading, deciduous. *Petals* 4, spreading, obovate, entire or crenulate, clawed, imbricate or open in bud. *Stamens* about 6; filaments adnate to the long slender androphore, spreading above. *Ovary* stalked, elongated, with many ovules on 2 placentas; style short or elongated; stigma small or capitate, 2-lobed. *Fruit* a capsule, compressed or somewhat terete, often elongated. *Seeds* reniform or orbicular, compressed, rugose or tuberculate.

Annual herbs, glabrous, pilose or glandular; leaves 3-7-foliolate; flowers white or purple, often showy, in leafy racemes.

Species about 21, natives of the tropics; 1 species in South Africa, recorded from the Transvaal, Barkly West, and S.W. Africa.

3090

3. POLANISIA, Rafin.

(*Dianthera*, Klotsch. *Tetrateleia*, Sond.)

Sepals 4, spreading, lanceolate, free or connate at the base, deciduous. *Petals* 4, sessile or clawed, entire, equal or unequal, imbricate. *Receptacle* depressed, small, sometimes produced into a gland at the back. *Stamens* 8, or often more, very rarely 6, intermixed with staminodes, inserted at the base of the receptacle. *Ovary* sessile or stalked, often glandular, with many ovules; style elongated, or stigmas sub-sessile. *Fruit* a sessile or stalked capsule, elongated, cylindric or compressed. *Seeds* reniform, transversely rugose or reticulate.

Annual herbs, often glandular and strong-smelling; leaves simple or 3-9-foliolate, the upper bract-like; flowers yellow, rose, or purple, in terminal racemes.

Species about 30, found in all warm regions; 7 species in South Africa, extending from the Transvaal through the north-western districts to S.W. Africa.

3097

4. BACHMANNIA, Pax

Calyx 4, tubular up to the middle. *Petals* similar. *Stamens* about 10; filaments free or joined. *Disc* 0. *Gynophore* very short. *Ovary* with 2 parietal placentas.

A glabrous shrub; leaves 2-3-foliate; flowers in umbellate clusters.

Endemic; species 2, recorded from Natal to Pondoland.

3101

5. CAPPARIS, Linn.

Sepals 4, very rarely 5, free or connate at the base, naked or with a gland or ligule within, valvate or imbricate. *Petals* 4, very rarely more, sessile, imbricate. *Torus* short. *Stamens* indefinite, inserted on the torus in several series; filaments filiform, free. *Ovary* on a long stalk, 1-4-chambered, with many ovules on 2-6 parietal placentas; style 0; stigma sessile. *Fruit* fleshy, indehiscent, rarely opening by valves, globose or cylindric, often elongated. *Seeds* many, immersed in a pulp, with a leathery or crustaceous testa.

Trees or shrubs, often scandent, unarmed, spinous, or prickly, glabrous, scaly or tomentose; leaves simple, rarely 0, alternate or rarely opposite; stipules bristle-like or spiny; flowers generally white or cream-coloured, axillary or nearly so, solitary; inflorescence a raceme, panicle, or corymb.

Species about 270, found in all warm and tropical countries; 18 species in South Africa, extending from the northern Transvaal, through Natal and the coastal belt to Knysna; rare in the central districts.

3106

6. BOSCIA, Lam.

Sepals 4, free to the base or very nearly so, valvate, deciduous. *Petals* 0. *Disc* forming an entire or fimbriate ring at the base of the calyx. *Stamens* 6-20, inserted on the torus, free or connate at the base. *Ovary* stalked, ovoid, with few (6-12), rarely numerous, ovules, on 1-2 placentas; style short; stigma small, capitate. *Fruit* shortly stalked or sub-sessile, globose, crustaceous or leathery, 1- or few-seeded, indehiscent. *Seeds* lying in a pulp.

Unarmed shrubs; leaves alternate, simple, leathery; stipules setaceous, minute; flowers often small, in terminal racemes or corymbs.

An African genus of 44 species; 4 species in South Africa, recorded from the Transvaal, Graaff-Reinet, and from the eastern coastal districts.

3109

7. CADABA, Forsk.

(*Schepperia*, Neck.)

Sepals 4, unequal, in 2 series; the outer pair valvate enclosing the inner. *Petals* 2-4, rarely 0, inserted on the torus, clawed. *Disc* equalling the claw of the petals, trumpet-shaped or spatulate, with a tubular claw. *Stamens* 4-8, inserted on the torus; filaments free or connate at the base, often declinate. *Ovary* long-stalked, 1-chambered, or appearing 2-chambered owing to the cohesion of the placentas, with many ovules on 2-4-placentas; stigma sessile. *Fruit* fleshy, cylindric, indehiscent, or leathery and tardily dehiscent by 2-valves. *Seeds* sub-globose.

Shrubs, unarmed or with the branches spinescent above; leaves simple, 3-foliate, or 0; flowers yellowish or purplish; inflorescence an axillary solitary raceme or corymb.

Species about 30, natives of Africa, tropical Asia, Arabia, and Australia; 2 species in South Africa, extending from the Transvaal and Natal to Riversdale, but also found in the central districts.

3112

8. MAERUA, Forsk.

(Niebuhria, DC.).

Sepals 4, very rarely 3, connate below into a tubular or infundibuliform tube, which is more or less persistent; lobes deciduous, valvate. *Petals* 4 or 0, inserted in the mouth of the calyx-tube. *Disc* usually distinct, lining the calyx-tube, with or without a free toothed fimbriate or nearly entire margin. *Stamens* indefinite, inserted on a columnar torus which usually equals or slightly exceeds the calyx-tube; filaments free, exserted. *Ovary* cylindric, linear, oblong, or ovoid, on a long gynophore, 1-chambered, or 2-chambered by the cohesion of the placentas, with many ovules on 2-4 parietal placentas or inserted on the spurious dissepiment; stigma sessile or sub-sessile. *Fruit* a berry, ovoid, globose, or narrow, sometimes moniliform, sometimes separating into 1-seeded portions.

Shrubs or small trees, without spines, glabrous or pubescent; leaves simple or 3-foliate; stipules, when present, setaceous; flowers axillary, solitary or fascicled, or in terminal racemes or corymbs.

Species about 50, natives of Asia, Africa, and India; 8 species in South Africa, all in the eastern districts and the Transvaal; also recorded from Albany.

71. RESEDACEÆ.

Flowers bisexual, rarely unisexual. *Calyx* persistent, 4-8-partite, unequal or sub-equal; lobes imbricate. *Petals* 4-8, rarely 2 or 0, deciduous or persistent, hypogynous or perigynous, entire or 3 to many-fid. *Disc* hypogynous, sessile or stalked, very often dilated above. *Stamens* 3-40, perigynous or inserted on the disc; filaments free or connate; anthers 2-theous. *Gynaecium* of 2-6 distinct carpels, or carpels united and forming a 1-chambered ovary; ovary sessile or stalked, superior, open at the top, with many, rarely few, ovules on parietal placentas; stigma sessile. *Fruit* an open dry or fleshy capsule, or of follicles. *Seeds* many, rarely few, reniform or horseshoe-shaped; embryo curved; endosperm 0.

Annual or perennial herbs, rarely shrubby; leaves scattered or fascicled, simple, trifid, or pinnatifid; stipules very small, gland-like; inflorescence a raceme or spike; bract 1.

Genera 6, with about 60 species, natives of South Europe, northern Africa, Asia Minor, and Persia.

3126

1. OLIGOMERIS, Cambess.

Calyx 4-5-partite; segments sometimes unequal. *Petals* 2, simple, free or connate at the base. *Disc* 0. *Stamens* 3-8, hypogynous; filaments connate at the base. *Ovary* sessile, 4-angled, with 4 conical points, with many ovules on 4 parietal placentas. *Fruit* a membranous inflated 4-horned capsule, open at the summit. *Seeds* many.

Annual or perennial herbs, woody at the base; leaves linear, entire, scattered or fascicled; flowers small, in terminal laxly-flowered spikes.

Species 5, natives of Africa, Syria, Persia, and India; 4 species in South Africa, extending from the Transvaal to the eastern parts of the Karroo, the north-western districts and to S.W. Africa, and from Natal to the Fish River Rand (Albany district).

72. MORINGACEÆ.

Flowers bisexual, irregular. *Calyx-tube* short; lobes 5, unequal, imbricate. *Petals* 5, similar to the sepals; the 2 upper smaller; the lateral ascending; the anterior large and projecting outwards. *Disc* lining the calyx. *Stamens* inserted on the margin of the disc; 5 fertile; 5 reduced to staminodes; filaments free; anthers 1-theous. *Ovary* superior, stalked, terete, villous, 1-chambered, with many ovules on 3 parietal placentas; style terminal, slender, truncate at the apex. *Fruit* an elongated siliqua-like capsule, 3-6-angled, rostrate, 1-locular, opening by 3 valves, many-seeded. *Seeds* large, ovate, 3-winged or wingless; endosperm 0.

Unarmed trees; leaves deciduous, alternate, 2-3-pinnate; pinnae and pinnules opposite; leaflets obovate, entire, caducous; stipules 0 or glandular; flowers large, red or white, in hairy axillary panicles.

Genus 1; species 4, natives of Asia, Africa, and India.

3128

1. MORINGA, Juss.

Characters of the family.

One species widely spread in S.W. Africa.

73. DROSERACEÆ.

Flowers bisexual. *Calyx* 4-5 (rarely 8-) partite, or sepals free, imbricate, persistent. *Petals* 5, more rarely 4-8, hypogynous, rarely epigynous, free or connate at the base, imbricate. *Stamens* 4-20, hypogynous or perigynous, very rarely epipetalous; filaments free or rarely connate at the base; anthers basifixed or versatile, 2-theous. *Ovary* superior or adhering to the base of the calyx, globose or ovoid, 1-3-chambered, with many, rarely few, ovules in each chamber; styles 1-5, filiform or club-shaped, simple, 2-fid or multifid. *Fruit* a membranous or chartaceous capsule, 1-5-locular, opening by 2-5-valves, very rarely opening irregularly, many-seeded, rarely each loculus 1-seeded. *Seeds* erect, horizontal, or pendulous; embryo straight; endosperm fleshy.

Perennial herbs, rarely undershrubs, dwarf or elongated, often glandular-pilose; leaves alternate, lax or crowded, very rarely verticillate, often rosulate and petioled, entire, 2-fid or pinnatifid, usually rolled in bud; flowers often large, fugacious; inflorescence various.

Genera 6, with over 100 species, natives of the temperate zone and tropics of both hemispheres.

Ovary 1-chambered; styles 2-5, free or almost so 1. *Drosera*, Linn.

Ovary 3-chambered; style simple 2. *Roridula*, Linn.

3136

1. DROSERA, Linn.

Calyx-tube short or very short; lobes 4, 5, or 8. *Petals* 4, 5, or 8, spatulate, hypogynous or perigynous. *Stamens* as many as the petals and inserted with them. *Ovary* superior, 1-chambered, with numerous, very rarely few, ovules on 2-5 placentas; styles 2-5, free or connate at the base, entire or variously divided. *Fruit* an oblong capsule, opening by 2-5 valves, many seeded. *Seeds* minute.

Stemless or caulescent herbs; leaves alternate or rosulate, sessile or petioled, rounded, spatulate, or peltate; stipules 0, or scarious and adhering to the base of the dilated petiole; flowers large and showy, white or rosy, solitary, or inflorescence a raceme, cyme, or corymb.

Species about 140, widely spread except in the Pacific Islands; 10 species in South Africa, extending from the Transvaal and Natal through the coastal belt to Clanwilliam.

3138

2. RORIDULA, Linn.*

Calyx 5-partite. *Petals* 5, oval or oblong. *Stamens* 5, hypogynous; anthers connate, opening by a terminal pore. *Ovary* superior, 3-chambered, with 1-2 pendulous ovules in each chamber; style simple; stigma capitate. *Fruit* a 3-angled 3-locular 3-seeded capsule opening by 3 valves. *Seeds* large, pendulous, with a granulated testa.

Suffruticose herbs, glandular-pilose; leaves linear, or subulate, or lanceolate, entire or pinnatifid; inflorescence a simple or spicate raceme; flowers large, white or rosy; bracts 2.

Endemic; species 2, known from Clanwilliam and Tulbagh.

74. PODOSTEMONACEÆ.

Flowers bisexual. *Perianth* of 2-3 minute scales, rarely larger and 3-parted. *Stamens* hypogynous, 1 to many; filaments free or united; anthers 2-theous. *Ovary* superior, 1-3-chambered, with a central placenta and numerous sub-sessile inverted ovules; styles 2-3; stigmas capitate. *Fruit* a 1-3-locular capsule. *Seeds* many, minute; endosperm none.

Aquatic herbs, resembling mosses or algæ; inflorescence a cyme, or flowers solitary, usually enclosed in a spathe when young.

Genera about 20, with about 125 species, chiefly in the tropics and subtropics of the Southern Hemisphere.

Perianth 3-partite; stamen 1; leaves entire . . . 1. *Tristicha*, Thouars

Perianth of 2 small linear segments; stamens 2; leaves lacinate

2. *Sphaerotherylax*, Bisch.

3140

1. TRISTICHA, Thouars

Perianth membranous, 3-partite; segments oblong, slightly imbricate. *Stamen* 1. *Ovary* oblong, 3-chambered; styles 3, short, linear; stigmas decurrent on the inner side of the styles. *Capsule* oblong, crustaceous, septically and septifragally 3-valved.

Herbs, with a moss-like habit, growing under water and attached to rocks by a flat-lobed thallus; stem slender, much-branched; leaves small, sessile, entire, pellucid, 1-nerved; flowers terminal or axillary; pedicels stiffly erect, each with 3 bracts at the base.

Species 3, natives of Africa, the Mascarene Islands, and tropical America; 1 species in South Africa, recorded from Natal, Kingwilliamstown, and Calvinia.

3159

2. SPHAEROTHYLAX, Bischoff

Flowers subtended by 2 minute scales. *Stamens* 2; filaments united at the apex; anthers 2 and each 2-theous, or solitary and 4-theous; staminodes 2, small, linear. *Ovary* ovoid, 8-ribbed; stigmas 2, short, lanceolate, sessile. *Capsule* ovoid, splitting into 2 unequal valves; the larger persistent; the smaller deciduous. *Seeds* ellipsoid, compressed.

Aquatic herbs; stems slender and branched; leaves elongated, lacinate; the small spathes produced both on the thallus and on the elongated stems.

Species 4, all African; 1 species recorded from Tembuland and doubtfully from Natal.

* NOTE.—Engler and others place *Roridula* under the family *Ochnaceæ*.

75. HYDROSTACHYACEÆ.

Plants dioecious. *Perianth* 0. *Stamen* 1; anthers 2-theous. *Ovary* superior, 1-chambered, with 2 parietal placentas and numerous inverted ovules; styles 2, connate in the lower half. *Fruit* a capsule. *Seeds* many; endosperm none.

Aquatic herbs; stem tuberous; leaves large, pinnately branched, with a sheath and a ligule; inflorescence a spike; flowers bracteate.

Genus 1; species about 16, natives of Africa and the Mascarene Islands.

3160

1. HYDROSTACHYS, Thouars

Characters of the Family.

1 species occurs in Natal.

76. CRASSULACEÆ.

Flowers bisexual, very rarely unisexual, regular. *Calyx* persistent, 3-5-, rarely 6-30-, partite. *Petals* as many as the sepals, free or more or less connate, often persistent, erect or spreading, or with an erect claw and a spreading limb. *Stamens* perigynous or almost hypogynous, as many as, or twice as many as the petals, free, or the alternate or all adnate to the petals; filaments filiform or subulate. *Glands* at the base of each carpel or confluent with them, oblong, cuneate, linear or round, rarely longer than broad, very rarely petaloid, rarely 0. *Gynaecium* of free carpels, as many in number as the petals, or very rarely the carpels more or less connate or completely connate, with many ovules in 2 to many series, rarely ovules solitary, erect or pendulous. *Fruit* of free follicles, very rarely a 4-locular capsule, many seeded. *Seeds* very often minute; embryo terete; endosperm fleshy.

Herbs or undershrubs, differing greatly in habit, often fleshy or succulent; leaves opposite or alternate, frequently in basal rosettes, frequently the leaves of each pair connate at the base, simple, or rarely cut or pinnate; stipules 0; flowers very often in cymes; bracts present or absent.

Genera 16, with over 400 species, chiefly natives of temperate Europe, Asia, North Africa, many in North America, rare in South America and Australia.

- | | |
|---|---------------------------------|
| 1. Carpels joined forming a 4-chambered ovary | 6. <i>Pagella</i> , Schönl. |
| Carpels free, more rarely connate at the base | 2 |
| 2. Style with a decidedly dorsal stigma | 5. <i>Dinacria</i> , Harv. |
| Stigma terminal, rarely sub-dorsal | 3 |
| 3. Calyx 3-4-partite or -fid | 4 |
| Calyx 5-, rarely 6-9-partite or -fid | 6 |
| 4. Petals free or almost so; stamens 3-4 | 4. <i>Crassula</i> , Linn. |
| Petals joined to form a tube; stamens 8 | 5 |
| 5. Calyx inflated, cylindric or 4-angled, shortly 4-fid; corolla shortly 4-fid | 2. <i>Bryophyllum</i> , Salisb. |
| Calyx 4-partite almost to the base; corolla 4-partite | 3. <i>Kalanchoe</i> , Adans. |
| 6. Petals free or connate at base only | 4. <i>Crassula</i> , Linn. |
| Petals connate to form a distinct tube | 7 |
| 7. Small annual dichotomously-branched herbs | 7. <i>Grammanthes</i> , DC. |
| Undershrubs, more or less fleshy and robust | 8 |
| 8. Leaves not connate at the base; stamens twice as many as the corolla-lobes; very rarely as many as the corolla-lobes | 1. <i>Cotyledon</i> , Linn. |
| Leaves connate at the base; stamens as many as the corolla-lobes | 8. <i>Roechia</i> , DC. |

3164

1. COTYLEDON, Linn.

Calyx 5-partite, equalling or shorter than the tube of the corolla. *Corolla-tube* narrow or wide, urceolate or cylindric, terete or 5-angled; limb spreading or reflexed, spirally twisted in bud. *Stamens* 10, very rarely 5, inserted on the tube of the corolla near the base; filaments filiform, short or elongated, frequently broadened at the base; anthers oblong, exserted or included. *Glands* linear, oblong, or quadrate, sometimes broader than long. *Gynaecium* of 5 free carpels each narrowed into a filiform or subulate style, with many ovules in each ovary; stigmas obliquely capitate. *Fruits* of separate follicles, many seeded.

Herbs or more or less fleshy undershrubs, of various habit; leaves opposite or alternate, sessile or petioled, often very fleshy; flowers erect or pendulous, varying from small to large, sometimes showy, arranged in spikes, racemes, or cymes.

A genus of over 180 species, natives of western and southern Europe, Africa, eastern Asia, the Himalayas, and Mexico; about 50 species in South Africa, with a wide distribution.

3165

2. BRYOPHYLLUM, Salisb.

Calyx inflated, cylindric or 4-angled, shortly 4-fid, with the lobes valvate. *Corolla-tube* urceolate or sub-campanulate; limb shortly 4-fid, spreading. *Stamens* 8, in 2 rows, inserted on the corolla-tube; filaments filiform; anthers oblong, shortly exserted. *Glands* 4, oblong, free or united to the carpels. *Gynaecium* of 4 free carpels, or carpels connate at the base; carpels elongated, attenuated into elongated styles, with many ovules in each ovary; stigmas capitate. *Fruit* of 4 free follicles, each follicle many seeded.

Succulent undershrubs; leaves opposite, petioled, simple, imparipinnate or crenate; flowers large, nodding, arranged in many-flowered panicle cymes; panicles opposite the branches.

Species 5, natives of tropical Africa, with 1 species widely dispersed; 2 species recorded from the Transvaal and Delagoa Bay.

3166

3. KALANCHOE, Adans.

Calyx 4-partite almost to the base, shorter than the corolla-tube; segments linear, ovate, or subulate. *Corolla* with an urceolate tube and a 4-parted spreading limb. *Stamens* 8, in 2 rows, adnate to the corolla-tube; filaments short; anthers oblong, included. *Glands* 4, linear or oblong. *Gynaecium* of 4 carpels, adnate to the base of the corolla-tube; carpels lanceolate, attenuated into the subulate styles, with many ovules in each ovary; stigmas obliquely truncate. *Fruit* of 4 membranous follicles, many-seeded.

Herbs or robust undershrubs; leaves opposite, fleshy, sessile or petioled, entire, crenate, or pinnatifid; flowers large, arranged in many-flowered panicle cymes.

Species about 160, natives of Asia, Africa, Madagascar, Arabia, and Brazil; 14 species in South Africa, extending from the Transvaal and Natal through the coastal belt to Riversdale; rare in the central districts.

3168

4. CRASSULA, Linn.

(*Bulliardia*, DC.; *Helophytum*, E. & Z.)

Calyx 3-5-partite or -fid; lobes erect or spreading. *Petals* 3-5 (rarely 6-9), free or connate at the base, erect or spreading, sometimes with a more or less blunt mucro behind the apex. *Stamens* 3-5, shorter than the petals.

Glands various. *Gynaecium* of 3-5 (rarely more) free carpels, each attenuated into a short style, with many ovules in each ovary; stigmas small. *Fruit* of 3-5 (rarely more) many-seeded follicles.

Herbs or shrubs, rarely aquatic, fleshy; leaves opposite, rarely petioled, often connate at the base, fleshy, entire or with cartilaginous-ciliated margins, glabrous, pubescent, or scaly; flowers usually somewhat small, white, rosy, rarely yellow, often in loose cymes, rarely in heads.

Species over 300, mostly South African, a few in tropical Africa, Abyssinia, and the Himalayas; 248 species in South Africa, widely dispersed.

3168a

5. DINACRIA, Harv.

Calyx deeply 5-partite. *Petals* 5, sub-connate at the base, with a broad claw; lamina spreading or recurved. *Stamens* 5, shorter than the petals; filaments filiform; anthers ovate, apiculate. *Glands* 5, narrowly cuneate, truncate. *Gynaecium* of 5 free carpels, with few ovules in each ovary; stigmas decidedly dorsal, sessile, oblong. *Fruit* of few-seeded follicles.

Small annual herbs, with trichotomous branches and distant nodes; leaves opposite, fleshy, obovate or oblong, obtuse; flowers small, white, in cymes arranged in corymbose clusters.

Endemic; species 3, extending from the Cape Peninsula to Uitenhage and the neighbourhood of Grahamstown.

3168b

6. PAGELLA, Schönl.

Sepals 4, slightly connate at the base, similar to the leaves but smaller, papillose at the apex. *Petals* 4, connate at the base, broadly obovate-cuneate, microscopically papillose, sub-erect, incurved at the apex, persistent. *Stamens* 4, in 1 row, alternating with and shorter than the petals; filaments abruptly incurved; anthers dorsifixed, oblong. *Ovary* 4-chambered, depressed, flat above, microscopically papillose, with a deep cavity in the middle, with many ovules; styles free, minute; stigmas very minute, oblong. *Glands* a little longer than the ovary, narrowly linear, slightly dilated at the apex. *Fruit* a many-seeded capsule.

A fleshy annual herb, with much the general appearance of a liverwort; primary stem obconic and then disc-like, densely covered with leaves and flowers; leaves numerous at the margin of the disc, in a dense rosette, small, fleshy; the lower cuneate, sub-flat, pale green; the upper larger and thickened, obliquely truncate, papillose, deep green; inflorescence many-flowered, on the flat top of the stem; flowers sessile; bracts resembling the leaves but much smaller.

Endemic; species 1, only known from the Montagu and Worcester districts

3170

7. GRAMMANTHES, DC.

Calyx campanulate, 5-fid to the middle. *Corolla-tube* equalling the calyx; limb spreading, 5-6-lobed. *Stamens* 5-6, adnate to the tube of the corolla; filaments subulate; anthers oblong, exserted. *Glands* minute or 0. *Gynaecium* of 5-6 carpels, each attenuated into a subulate style, with many ovules in each ovary; stigmas somewhat capitate, obliquely truncate. *Fruit* of 5 free many-seeded follicles.

Small rigid annual herbs, dichotomously branched, glabrous and somewhat glaucous; leaves opposite, oblong or linear, fleshy, entire; flowers yellow or golden, in paniculate cymes.

Endemic; species 1, typically of the south-western districts and extending to Mossel Bay, but also recorded from Namaqualand and Basutoland.

3171

8. ROCHEA, DC.

Calyx 5-parted or deeply 5-cleft. *Corolla* united into a tube longer than the calyx; limb 5-partite, spreading. *Stamens* 5, adnate to the petals, included; filaments filiform; anthers linear-oblong. *Glands* minute. *Gynaecium* of 5 free carpels, with many ovules in each ovary; styles free, or all or some connate; stigmas somewhat capitate or obliquely truncate. *Fruit* of 5 many-seeded follicles.

Fleshy shrublets; leaves opposite, connate at the base, oblong, obovate, or lanceolate; flowers large, white, yellow, rosy, or scarlet, in cymes arranged in corymbose heads.

Endemic; species 4, typically of the south-western districts, but 1 species found on the Cockscombe Mountains.

77. SAXIFRAGACEÆ.

Plants sometimes dioecious. *Flowers* usually bisexual, more rarely unisexual or bisexual with occasional unisexual flowers. *Calyx* usually of 5 sepals, sometimes 4, with the tube adnate to the ovary. *Petals* usually 5, more rarely only 4, free or sometimes connate, rarely 0, imbricate or valvate. *Stamens* as many or twice as many as the petals, perigynous or epigynous. *Ovary* superior or inferior, 1-7-chambered, rarely of free carpels, with many ovules on parietal or axile placentas; styles simple, or styles free and as many as the carpels. *Fruit* a capsule or berry. *Seed* with copious endosperm surrounding a small embryo, rarely endosperm 0.

Perennial herbs, shrubs, or trees; leaves usually alternate, more rarely opposite; stipules rarely present; inflorescence various, racemose or cymose. Genera 75, with about 600 species, found chiefly in temperate regions.

- | | |
|--|-------------------------------|
| 1. Leaves opposite | 1. <i>Vahlia</i> , Thunb. |
| Leaves alternate | 2 |
| 2. Leaves entire | 2. <i>Montinia</i> , Linn. f. |
| Leaves serrate, with the teeth glandular | 3. <i>Choristylis</i> , Harv. |

3201

1. VAHLIA, Thunb.

Calyx-lobes 5, ovate or lanceolate, valvate. *Petals* 5, obovate-spathulate, shorter than the calyx-lobes. *Stamens* 5, inserted on the margin of an epigynous disc; filaments subulate. *Ovary* inferior, 1-chambered, with numerous ovules on placentas pendulous from the apex of the chamber; styles 2, rarely 3, short or elongated; stigmas somewhat capitate. *Fruit* a sub-globose or obovoid capsule, 2-, rarely 3-, valved at the apex, many-seeded. *Seeds* minute, oblong.

Herbs, often glandular, pubescent, sub-dichotomously branched; leaves opposite, entire; stipules 0; flowers white, pedicelled or sub-sessile, axillary, 2-nate.

Species 6, natives of Africa, tropical and sub-tropical Asia; 2 species in South Africa, found in the Transvaal, the Orange Free State, the north western districts, and S.W. Africa.

3238

2. MONTINIA, Linn. f.

Plants dioecious. *Male flowers*: *Calyx-tube* shortly 4-lobed, persistent. *Petals* 4-5, rounded, fleshy, deciduous, imbricated. *Stamens* 4-5, inserted below the margin of the disc and alternating with the petals; filaments subulate-filiform; anthers oblong. *Rudimentary ovary* 0. *Female flowers*:

Calyx-tube oblong, adnate to the ovary; limb very short, 4-angled. *Petals* as in the male. *Stamens* 0. *Disc* epigynous, somewhat thick, 4-angled. *Ovary* inferior, elliptic-oblong, imperfectly 2-chambered, with many ovules in 2 rows on longitudinal placentas; style short, thick; stigma large, capitate, 2-lobed, with the lobes deeply emarginate. *Fruit* a sub-woody capsule, attenuated at either end, 1-locular, opening by 2 valves, with the seeds on a free central columnar placenta. *Seeds* strongly compressed, imbricate, with a broad marginal wing; endosperm 0.

A glabrous shrub, with furrowed branches; leaves alternate, petioled, coriaceous, sub-lanceolate, acuminate, entire, veinless; flowers small, white; the male in terminal few-flowered corymbs; the female solitary.

Endemic; species 1, extending from Namaqualand through the coastal belt to Port Elizabeth and dry localities in the Albany district.

3241

3. CHORISTYLIS, Harv.

Flowers unisexual, with occasional bisexual flowers. *Calyx-lobes* 5, subulate, persistent. *Petals* 5, inserted on the margin of the calyx-tube, longer than the calyx-lobes, ovate-deltoid, pubescent, persistent, valvate. *Stamens* 5, alternating with the petals and inserted with them; filaments short, subulate, puberulous; anthers small, ovate. *Ovary* inferior, 2-chambered, with many ovules on axile placentas; styles 2, subulate, erect, at length recurved; stigmas capitate. *Fruit* a semi-superior capsule, 2-locular, many-seeded, conical at the apex, opening septicidally through the styles. *Seeds* oblong, curved.

A shrub; leaves alternate, petiolate, ovate-oblong, acute, with glandular teeth; stipules 0; flowers small and green, in much branched panicles shorter than the leaves.

Endemic; species 1, found in the northern Transvaal and extending through Natal and the coastal belt as far as Stutterheim.

78. PITTOSPORACEÆ.

Flowers bisexual, regular or a little oblique. *Sepals* 5, distinct, imbricate, or rarely connate at the base. *Petals* 5, imbricate, longer than the sepals, with the claws often more or less connate into a tube. *Stamens* 5, hypogynous, free, alternating with the petals; filaments filiform or dilated at the base or middle; anthers versatile, 2-theous. *Receptacle* small, conical, or rarely produced into a short gynophore or 5-glands. *Ovary* superior, 1-chambered or incompletely 2-5-chambered, with many ovules on parietal placentas, or in 2 rows on a central placenta; style simple; stigma minute or dilated, entire or minutely toothed. *Fruit* a dehiscent capsule or indehiscent, sometimes succulent. *Seeds* many, rarely solitary, without appendages; embryo minute; endosperm hard.

Shrubs or trees; leaves alternate, entire, toothed or rarely slightly cut; stipules 0; inflorescence a corymb or panicle, or flowers solitary and drooping on terminal peduncles, or axillary, or fascicled.

Genera 9, with about 100 species, found in all warm countries.

3252

1. PITTOSPORUM, Banks

Sepals distinct or connate at the base. *Petals* cohering into a tube at the base or to beyond the middle or rarely spreading from the base. *Filaments* subulate; anthers erect, ovate-oblong. *Ovary* sessile or shortly stalked, more or less perfectly 2-, rarely 3-5-, chambered; style short. *Fruit* a globose ovate or obovate capsule; valves coriaceous or sub-woody.

Trees or shrubs; leaves entire or sinuate-toothed, sometimes sub-whorled at the apex of the branches; inflorescence terminal, corymbose, sub-umbellate or panicle, or flowers solitary or few, terminal, axillary or lateral.

Species about 133, natives of Africa, Asia, the Pacific Islands, Australia, and New Zealand; 2 species in South Africa, extending from the Transvaal and Natal through the eastern districts to Riversdale.

79. CUNONIACEÆ.

Plants sometimes dioecious. *Flowers* bisexual or unisexual. *Calyx* of 4-5 free sepals, or sepals united at the base. *Petals* 3-5, rarely 6-9, usually smaller than the calyx, often absent, imbricate. *Stamens* 8-10 or many, inserted beneath the disc. *Ovary* superior, 2-3-chambered, or rarely of free carpels, with 2 to many ovules in each chamber; styles usually free. *Fruit* a capsule, rarely a drupe or nut. *Seeds* with endosperm.

Trees or shrubs; leaves opposite, rarely ternate or whorled, simple, or 3-5-foliolate, or imparipinnate; inflorescence a head, raceme, or panicle.

Genera 20, with about 117 species, natives of the Fiji Islands, New Caledonia, Australia, South America, Tasmania, New Zealand, Madagascar, and Africa.

Flowers in long-peduncled axillary panicles; ovary not horned

1. *Platylophus*, Don

Flowers in dense spike-like racemes; ovary 2-horned

2. *Cunonia*, Linn.

3269

1. PLATYLOPHUS, Don

Calyx-tube very short, adnate to the base of the ovary; lobes 4-5, triangular-ovate, persistent, valvate. *Petals* 4-5, inserted at the base of an urceolate perigynous disc, shorter than the calyx, 3-fid or 3-toothed. *Stamens* 8-10, inserted with the petals; filaments filiform-subulate; anthers didymous. *Ovary* superior, 2-chambered, with 2 collateral ovules below the apex of each chamber; styles 2, subulate, recurved; stigmas simple. *Fruit* a turgid capsule, 2-locular, 2-seeded, at length opening by 2 valves. *Seeds* oblong, curved; endosperm present.

A large umbrageous tree, glabrous in all parts; leaves opposite, petioled, coriaceous, 3-foliolate; leaflets lanceolate, acute, shortly toothed, veiny; stipules small, deciduous; flowers small, in long-peduncled many-flowered axillary panicles.

Endemic; species 1, only known from the coastal belt between Riversdale and Port Elizabeth.

3275

2. CUNONIA, Linn.

Calyx-tube short; lobes 5, imbricate, deciduous. *Petals* 5, inserted under the margin of the disc which is adnate to the ovary, oblong, imbricate. *Stamens* 10, inserted with the petals; filaments exerted; anthers didymous. *Ovary* superior, 2-chambered, 2-horned, confluent with the disc at the base, with numerous pendulous ovules in 2 rows; styles 2, subulate; stigmas simple. *Fruit* a 2-horned 2-locular coriaceous capsule, opening by 2 valves, many-seeded. *Seeds* oblong, with a narrow membranous wing; endosperm fleshy.

Trees or shrubs; leaves opposite, petioled, 3-foliolate or imparipinnate; leaflets 2-3-jugate, lanceolate, obtuse, glandular-serrate; stipules large, oblong, caducous; flowers in densely many-flowered spike-like racemes.

Species about 10, natives of New Caledonia; 1 species in South Africa, extending from Zululand through the coastal belt to Worcester.

80. MYROTHAMNACEÆ.

Plants dioecious. *Perianth* 0. *Male flowers*: *Stamens* 4-8, often 5; filaments connate; anthers basifixed, opening by longitudinal slits, with the connective produced into a beak. *Rudimentary ovary* 0. *Female flowers*: *Staminodes* 0. *Ovary* superior, sessile, obtusely 3-angled, 3-lobed above, 3-chambered, with numerous ovules in 2 rows on the inner angles of the chambers; styles 3-4, free, short; stigmas broadened. *Fruit* a small capsule, or separating in nutlets, many-seeded. *Seeds* minute, pendulous, with a short funicle; embryo minute; endosperm copious.

Balsamiferous shrubs or undershrubs; leaves opposite, very shortly petioled, folded fan-like, entire, articulated to the petiole; stipules sub-spinescent and with the petioles persistent; flowers in terminal spikes.

Genus 1; species 1.

3282

1. MYROTHAMNUS, Welw.

Characters of the family.

Species 1, found in the Transvaal and Natal, but also extends into Rhodesia.

81. BRUNIACEÆ.

Flowers bisexual, regular. *Receptacle* hollowed out and more or less adnate to the ovary. *Calyx* 5-fid, erect, with the segments imbricate. *Petals* 5, perigynous or epigynous, sessile or clawed, usually free, rarely united into a tube, often persistent, imbricate. *Stamens* inserted with the petals and alternating with them, free or cohering to the base of the petals, very rarely inserted in the corolla throat; anthers oblong, ovate, or linear, 2-theous. *Ovary* often semi-inferior, rarely inferior or almost superior, 1-2- (rarely 3-) chambered with 1-10 pendulous ovules in each chamber; style simple, 2-fid, 2-partite, or 2-3-furrowed; stigma often minute, papillose. *Fruit* indehiscent, or often 2-coccus; seeds oblong, pendulous; embryo minute; endosperm copious, fleshy.

Shrubs or undershrubs, often heath-like, with the branches often densely leafy; leaves small, spirally densely imbricate, rarely sparse, sessile or very shortly petiolate, needle-like, linear, or oblong, rigid, terete, flat, or 3-angled; stipules 0; flowers very often small, solitary, axillary or terminal, or inflorescence in globose or flat heads, rarely spicate or paniced: heads sometimes with an involucre of leaves; bracts often 3, longer or shorter than the flowers.

Genera 12, with 65 species, all endemic, mainly confined to the southwestern districts of the Cape Province.

- | | |
|---|--|
| 1. Petals connate to form a distinct tube | 4. <i>Lonchostoma</i> , <i>Wickst.</i> |
| Petals free or connate at the base only | 2 |
| 2. Styles 2 | 3 |
| Style simple; stigma entire, emarginate, or stigmas 3 | 5 |
| 3. Flowers solitary in the axils of the upper leaves, the whole forming a crowded leafy spike | 5. <i>Linconia</i> , <i>Linn.</i> |
| Flowers in small globose ovoid broadly obconic or elongated heads | 4 |
| 4. Bracts leafy or absent; calyx-lobes broad; stamens generally included. | 6. <i>Raspalia</i> , <i>Brongn.</i> |
| Bracts scarious; calyx-lobes narrow; stamens always exerted | |
| | 7. <i>Nebelia</i> , <i>Neck.</i> |
| 5. Flowers solitary, terminal or axillary | 6 |
| Flowers in globose elongated or depressed heads, or in spikes, racemes, or panicles | 8 |

6. Filaments incurved ; anthers ovate or rounded ; ovary 1-chambered
 11. *Mniothamnea*, *Oliv.*
 Filaments straight ; anthers linear or oblong ; ovary 2-chambered . . . 7
7. Calyx-lobes much longer than tube ; calyx-tube not glandular ;
 fruit crowned by the annular disc and style . . . 2. *Thamnea*, *Soland.*
 Calyx-lobes about as long as the tube ; calyx-tube glandular ; fruit
 crowned with the remains of the calyx and corolla
3. *Tittmannia*, *Brongn.*
8. Anthers exserted ; flowers in oblong globose or ovoid heads . . . 9
 Anthers included ; flowers in small heads, racemes, panicles, or in
 spike-like heads . . . 10
9. Anthers sagittate ; ovary 2-chambered . . . 10. *Brunia*, *Linn.*
 Anthers linear ; ovary 1-chambered . . . 12. *Berzelia*, *Brongn.*
10. Stigmas 3, sessile ; flowers in spike-like heads ; ovary 3-chambered
 1. *Audouinia*, *Brongn.*
 Stigmas 2, sessile ; flowers in depressed heads, spikes, racemes, or
 panicles ; ovary 2-chambered . . . 11
11. Calyx-lobes very short ; petals not clawed . . . 8. *Staavia*, *Dahl.*
 Calyx united in a tube beyond the ovary ; petals with a very short
 2-tubercled claw . . . 9. *Pseudobæckeia*, *Niedenau*

3283

1. AUDOUINIA, Brongn.

Receptacle very short, obconic, adnate to the ovary. *Calyx-lobes* 5, large, oblong-lanceolate, scarious, ciliate. *Petals* 5, free or slightly connate at the base ; claw long, 2-keeled ; limb ovate. *Stamens* 5, included ; filaments elongated, somewhat thick ; anthers linear. *Ovary* semi-inferior, obconic, 3-chambered, with 2 collateral pendulous ovules in each chamber ; style columnar, 3-angled ; stigmas 3, sessile, hollow.

A low shrub, resembling a heath ; leaves spirally imbricate, sessile, linear, 3-angled ; flowers in oblong spike-like heads.

Species 1, confined to the south-western districts.

3284

2. THAMNEA, Soland.

Receptacle very short, obconic, adnate to the ovary. *Calyx-lobes* 5, elongate-lanceolate, scarious, much longer than the tube. *Petals* 5, free or slightly connate at the base, oblong-spathulate ; claw 2-keeled ; limb ovate, spreading. *Stamens* 5, included ; anthers linear-oblong. *Ovary* inferior, 2-chambered, with 2-8 ovules pendulous from the apex of a central column ; style simple, cylindric ; stigma obtuse. *Fruit* crowned by the annular disc and style.

Undershrubs ; leaves very small, spirally imbricate ; the upper forming an involucre round the flowers ; flowers small, terminal, solitary.

Species 7, confined to the south-western districts.

3285

3. TITTMANNIA, Brongn.

Receptacle spherical, ventricose, adnate to the ovary, glandular. *Calyx-lobes* 5, erect, lanceolate, broadly deltoid or oblong-subulate, about as long as the tube. *Petals* 5, free or connate at the base, spathulate-oblong, obovate-lanceolate, or elliptic. *Stamens* 5, included ; anthers linear or oblong. *Ovary* inferior, 2-chambered, with 2 pendulous ovules in each chamber ; style short ; stigma obscurely 2-toothed. *Fruit* a nut, globose, crowned with the remains of the calyx and corolla.

Small heath-like shrubs ; leaves acicular, linear-lanceolate, obtuse or tipped with a black mucro ; flowers solitary in the axils of the upper leaves and exceeding them.

Species 3, confined to the south-western districts.

3286

4. LONCHOSTOMA, Wickstr.

Receptacle very short, adnate to the base of the ovary. *Calyx-lobes* 5, ovate, obtuse, or narrow and linear-subulate, silky. *Petals* 5, connate into a 4-5-lobed tube; lobes oblong-spathulate, spreading. *Stamens* 4-5, inserted in the throat of the corolla-tube; filaments very short; anthers oblong-hastate, sometimes hairy. *Ovary* almost superior, 2-chambered, with 2-10 pendulous ovules in each chamber; style 1, with 2 minute stigmas, or styles 2. *Fruit* a 2-4-valved capsule.

Virgate shrubs; leaves alternate, sessile, ovate, elliptic, or oblong, obtuse, or tipped by a prominent black apiculus; flowers in terminal leafy heads.

Species 4, confined to the south-western districts.

3287

5. LINCONIA, Linn.

Receptacle short, adnate to the ovary. *Calyx-lobes* 5, very short, membranous. *Petals* free or slightly connate at the base, lanceolate, not clawed. *Stamens* included, filaments dilated; anthers cordate or sagittate, with the lower halves almost free. *Ovary* semi-superior, 2-chambered, with 2 ovules in each chamber; styles 2, erect, obtuse. *Fruit* 2-coccus, 1-2-seeded.

Heath-like shrubs, with numerous erect fastigiate branches; leaves spirally imbricated, very shortly petioled, linear to ovate-oblong; flowers solitary in the axils of the upper leaves, the whole forming a crowded leafy spike; bracts 4-5.

Species 3, found in the south-western districts as far as Riversdale.

3288

6. RASPALIA, Brongn.

Receptacle short, obconic, adnate to the ovary or almost free. *Calyx-lobes* 5, broad. *Petals* 5, free, oblong or linear-oblong, not clawed. *Stamens* 5, epigynous or inserted in the throat of the calyx, rarely exserted; filaments very short, subulate, anthers cordate or sagittate. *Ovary* superior or semi-superior, 2-chambered, with a single ovule, very rarely 2 ovules, in each chamber; styles 2, short, obtuse. *Fruit* 2-coccus, 1-seeded.

Heath-like shrubs; leaves densely imbricate, adpressed; flowers in small globose or elongated heads; bracts leafy or absent.

Species 9, found in the south-western districts as far as Riversdale.

3289

7. NEBELIA, Neek.

(*Berardia*, Brongn.)

Receptacle obconic, sub-elongate, adnate to the ovary; lobes 5, narrow. *Petals* 5, narrowly-oblong, free or connate at the base, without a claw. *Stamens* 5, exserted; filaments free or adnate to the corolla-tube at the base; anthers cordate or sagittate, with the thecae free at the base. *Ovary* half-inferior, 2-chambered, with a single pendulous ovule in each chamber; styles 2, divergent, filiform, obtuse. *Fruit* 2-coccus.

Undershrubs; leaves heath-like, subulate or linear, acute, incurved or erect-spreading; flowers in broadly obconic globose or ovoid heads, surrounded by the upper leaves; bracts 3, scarious.

Species 5, found in the south-western districts, but also recorded from Pondoland and Natal.

3290

8. STAAVIA, Dahl.

Receptacle obconic, adnate to the ovary. *Calyx-lobes* 5, very short. *Petals* 5, free or connate at the base, lanceolate or oblong, fleshy at the base, without

claws. *Stamens* 5, included; filaments short; anthers ovate. *Ovary* semi-inferior, 2-chambered, with a solitary ovule in each chamber; style 1, deeply and longitudinally grooved; stigmas 2, sessile. *Fruit* 2-coccus.

Heath-like undershrubs; leaves small, erect-spreading or recurved, linear or needle-like; the upper forming an involucre round the head; flowers small, in heads, very rarely in spikes; bracts longer or shorter than the leaves.

Species 10, found in the south-western districts as far as Riversdale.

3291

9. PSEUDOBÆCKEA, Niedenzu

Receptacle adnate to the ovary and united beyond the ovary. *Calyx-lobes* 5. *Petals* 5, with a very short 2-tubercled claw. *Receptacle* obconical. *Stamens* 5, included, equal, shorter than the petals; anthers adnate, shortly cleft. *Ovary* inferior, villous or glabrous, 2-chambered, with 1-2 ovules in each chamber; style short, thick; stigmas 2, sessile.

Ericoid undershrubs; leaves sometimes flattened; flowers small, in heads, racemes, or panicles, rarely solitary and axillary.

Species 10, found in the south-western districts, but extend to the Uitenhage district.

3292

10. BRUNIA, Linn.

Receptacle adnate to the ovary. *Calyx-lobes* 5, free, produced beyond the ovary. *Petals* 5, long, with a long claw, bearing a 2-lobed pouch. *Receptacle* cylindric. *Stamens* 5, unequal, longer than the petals; anthers versatile, deeply cleft. *Ovary* semi-inferior, 2-chambered, with 2 ovules in each chamber; style almost straight.

Ericoid shrubs or undershrubs; leaves usually densely imbricate; flowers in oblong or globose heads; heads terminal and solitary or arranged in racemes; bracts exceeding the flowers or hidden.

Species 7, found in the south-western districts, but extend to the Uitenhage district.

3293

11. MNIOTHAMNEA, Oliv.

Receptacle obconic, adnate to the ovary. *Petals* alternating with the calyx-lobes, twice as long, sessile or elliptic-oblong, with a thickened tubercle at the base within. *Stamens* 5, perigynous, included, inserted on the tube of the calyx, slightly shorter than the petals; filaments incurved; anthers ovate or rounded. *Ovary* semi-inferior, 1-chambered, with a single pendulous ovule; style simple, slightly furrowed.

An ericoid shrub; leaves very small, densely imbricate; flowers inconspicuous, solitary, axillary or terminal.

Species, confined to the south-western districts.

3294

12. BERZELIA, Brongn.

Receptacle obconic, pilose, adnate to the ovary. *Calyx-lobes* 4 or 5, subulate or linear-oblong, unequal, or sub-equal. *Petals* linear-spathulate, long-clawed, glabrous. *Stamens* 4-5, exserted; filaments filiform; anthers oblong or linear. *Ovary* semi-inferior, straight or gibbous, 1-chambered, with a solitary pendulous ovule; style subulate; stigma simple. *Fruit* indehiscent, obconic or turbinate.

Ericoid shrubs; leaves small, densely imbricate, spreading or erect; flowers small, congested in ovoid or globose nude heads.

Species 5, found in the south-western districts, but extend to the Uitenhage district and the neighbourhood of Grahamstown.

82. HAMAMELIDACEÆ.

Flowers bisexual or unisexual. *Perianth* sometimes absent in the female flowers. *Receptacle* hollowed out and more or less adnate to the ovary. *Calyx* truncate or 5-lobed, with the lobes valvate or imbricate. *Petals* 4 to many, rarely 0, perigynous or almost epigynous, linear-spathulate or obovate, imbricate or valvate, sometimes reduced to scales. *Stamens* as many as and alternating with the petals, sometimes accompanied by staminodes; filaments free; anthers 2-theous. *Disc* 0, or annular, or glandular, between the ovary and stamens. *Ovary* inferior, semi-inferior, or rarely superior, 2-chambered, sometimes with the septum imperfect, with 1 to many pendulous ovules in 1 to many rows; styles 2, subulate, deciduous or often persistent. *Fruit* a woody capsule. *Seeds* 2 to many, pendulous, sometimes winged; embryo straight; endosperm thin.

Trees or shrubs, glabrous, pubescent, or with stellate hairs; leaves alternate, rarely opposite, petioled, simple or pinnatifid, entire or serrate, with the teeth sometimes glandular; stipules 2, deciduous or persistent, rarely 0; flowers in heads or head-like spikes.

Genera 19, with about 50 species, found in most warm and tropical countries.

3311

1. TRICHOCLADUS, Pers.

Plants monoecious or diœcious. *Calyx* 5-partite, with the lobes valvate. *Petals* 5, linear-clavate, much longer than the calyx, with revolute margins, valvate, absent in female flowers. *Stamens* 5; filaments short, fusiform; anthers erect, connate, opening by valves. *Ovary* almost superior, tomentose, with a solitary ovule in each chamber; styles 2, subulate. *Fruits* woody, sub-globose, densely tomentose, 2-valved and with 2 cups.

Shrubs, with stellate tomentum or villous; leaves opposite or alternate, entire; stipules inconspicuous; flowers in dense terminal spikes.

An African genus of 5, probably 8, species; 3, probably 5, species in South Africa, extending from the northern Transvaal through Natal and the coastal belt to George.

[NOTE.—In all the specimens examined the male flowers had a well-developed 2-chambered ovary.]

83. ROSACEÆ.

Flowers usually regular and bisexual, more rarely unisexual or with occasional bisexual flowers. *Receptacle* hollowed out, free or adnate to the ovary, short or long, narrow or widened. *Calyx-lobes* usually 5, rarely 4 or many or 0, imbricate, occasionally with a second external row of segments alternating with the proper segments. *Disc* lining the calyx-tube, sometimes tumid or lobed. *Petals* equalling the number of calyx-lobes, rarely 0, imbricate, deciduous. *Stamens* usually indefinite, sometimes definite or reduced to 1 or 2, usually inserted with the petals; filaments subulate or filiform, sometimes connate; anthers usually didymous, very rarely elongated. *Gynaecium* of 1 or more carpels in 1 to many rows, free or more or less connate among themselves, or adnate to the receptacle, or inserted on one side of the receptacle-cup, sessile or stalked, with usually 2, rarely many, anatrophous pendulous or ascending ovules in each ovary or chamber; styles as many as the carpels, free or very rarely connate, inserted at the base or on the ventral face of the carpels, sometimes terminal; stigmas

capitate or penicillate. *Fruit* various, of dry achenes, succulent aggregated drupes, a many-locular capsule, a follicle, a pome, or a drupe. *Seeds* erect or pendulous; embryo straight, with fleshy cotyledons; endosperm none or very rarely present.

Herbs, shrubs, or trees, erect, prostrate, or scandent; leaves simple or compound, alternate or rarely opposite; petiole often dilated at the base and 2-glandular at the apex; stipules 2, free or adnate to the petiole, rarely 0 or obsolete; inflorescence various.

Genera 97, with over 1,000 species, the greater number massed in the temperate and colder parts of the northern hemisphere.

Tribe **Rubeæ**: Calyx-lobes often persistent, bracteate or ebracteate; stamens many; carpels many; ovary superior, with 2 pendulous ovules in each; shrubs or undershrubs; leaves often compound (genus 1).

Tribe **Potentillæ**: Calyx-lobes often persistent, bracteate or ebracteate; stamens 4 to many; carpels 4 to many, with a solitary ascending ovule in each ovary; style often ventral; herbs or undershrubs; leaves various (genera 2-3).

Tribe **Poteriæ**: Calyx-lobes often bracteate; petals often 0; carpels 1-3; ovary inferior or closed in the receptacle, with a solitary pendulous or ascending ovule in each ovary; fruit of dry achenes; herbs or shrubs; leaves various (genera 4-9).

Tribe **Neuradæ**: Calyx-lobes bracteate or ebracteate; petals 5; carpels 5 or 10; ovary inferior, with a solitary pendulous ovule in each; fruit a 5-10-valved capsule; herbs; leaves pinnatifid (genera 10-11).

Tribe **Prunæ**: Flowers symmetrical; calyx or calyx-lobes often deciduous, ebracteate; carpel 1; ovary superior, with 2 pendulous ovules; style subterminal; trees or shrubs; leaves simple, often serrate (genus 12).

Tribe **Chrysobalanæ**: Flowers often asymmetrical; calyx or calyx-lobes often deciduous, ebracteate; carpel 1; ovary superior, with 2 ascending ovules; style basal; trees or shrubs; leaves simple, entire (genera 13-14).

1. Ovary inferior, 5-10-chambered 2
- Gynæcium of free carpels or carpel 1, sometimes included in the
 receptacle, but not adnate to it 3
2. Calyx bracteate; petals small 10. *Neurada*, *Linn.*
- Calyx not bracteate; petals large 11. *Grielum*, *Linn.*
3. Petals 0 4
- Petals 5, rarely 10-12 or 0, but if so then 2 ovules in each ovary 7
4. Flowers unisexual; stigmas plumose 9. *Cliffortia*, *Linn.*
- Flowers bisexual, rarely some unisexual, but if so then stigmas
 brush-like, fimbriate or penicillate 5
5. Stigmas brush-like, fimbriate, or penicillate 6
- Stigmas capitate, not hairy 4. *Alchemilla*, *Linn.*
6. Calyx-lobes petaloid; stigmas brush-like 7. *Sanguisorba*, *Linn.*
- Calyx-lobes not petaloid; stigmas petate or dilated, fimbriate or
 penicillate 8. *Acæna*, *Linn.*
7. Carpel 1, inserted laterally in the mouth of the receptacle 8
- Carpels 1 to many, sessile, or stalked at the base of the receptacle,
 or on a raised receptacle 9
8. Ovules 2 13. *Hirtella*, *Linn.*
- Ovule solitary 14. *Parinarium*, *Juss.*
9. Trees or large shrubs, not prickly 10
- Herbs, rarely undershrubs, if large shrubs then covered with prickles 11
10. Leaves pinnate 6. *Leucosidea*, *E. & Z.*
- Leaves simple 12. *Pygeum*, *Gaertn.*
11. Receptacle armed with bristles or teeth 5. *Agrimonia*, *Linn.*
- Receptacle unarmed 12
12. Fruit fleshy; ovules 2 in each ovary 1. *Rubus*, *Linn.*
- Fruit of dry achenes; ovule solitary in each ovary 13
13. Fruits tipped with the hardened awn-like hooked or curled styles 3. *Geum*, *Linn.*

Fruits not tipped with a hardened style; receptacle hairy

2. *Potentilla*, *Linn.*

3353

1. RUBUS, Linn.

Receptacle expanded, convex in the centre only, without bracts. *Calyx-lobes* 5, persistent. *Petals* 5. *Stamens* indefinite, very rarely definite, inserted in the mouth of the receptacle; filaments filiform; anthers didymous. *Disc* lining the tube of the receptacle. *Gynaecium* of indefinite carpels, inserted on the receptacle, with 2 pendulous ovules in each ovary (one often very small); style sub-terminal, filiform; stigmas simple or capitate. *Fruit* of many small drupes, aggregated on a dry conical receptacle, 1-seeded.

Shrubs, rarely herbs, mostly trailing, armed with sharp prickles; leaves alternate, simple, lobed, 3-5-foliate, or imparipinnate (pinnate or digitate in the South African species); stipules adnate to the petiole; inflorescence a terminal or axillary panicle or corymb, rarely flowers solitary.

A genus of almost 3,000 described species, of which number probably not all are valid. -Natives of Europe, northern Africa, Asia, Indian, China, and North America; 5 species in South Africa, extending from the Transvaal, Swaziland and Natal through the eastern districts and along the coast belt to Van Rhynsdorp; rare in the inland districts, but recorded from Queenstown.

3356

2. POTENTILLA, Linn.

Receptacle concave, hemispherical, or urceolate, 5-, rarely 4-, bracteate at the base. *Calyx-lobes* 5, rarely 4, erect or spreading, triangular-ovate, valvate. *Petals* 5, rarely 4, obovate, orbicular or linear-spathulate. *Stamens* indefinite, perigynous, inserted with the petals; filaments subulate, triangular or hair-like; anthers small. *Disc* annular or lining the receptacle. *Gynaecium* of many carpels, rarely carpels few or very rarely one, situated on a convex receptacle, with a single pendulous ovule in each ovary; styles lateral; stigmas truncate or capitate. *Fruit* of small dry achenes on a convex hairy receptacle.

Herbs or undershrubs, rarely annuals; leaves alternate, or opposite the flowers, digitately 3-7-foliate or impari-pinnate; leaflets solitary or 2-3-nate, often lobed or divided; stipules adnate to the base of the petiole; inflorescence often a corymbose cyme, rarely flowers axillary and solitary.

Species about 500, very common in the temperate and frigid regions of the northern hemisphere; a single species in South Africa found near the Orange River in the Orange Free State, also in the Transvaal; 2 or 3 other species introduced.

3365

3. GEUM, Linn.

Receptacle persistent, 5-bracteate at the apex, rarely nude. *Calyx-lobes* 5, imbricate or valvate. *Petals* 5, orbicular or obovate, very often larger than the sepals. *Stamens* indefinite, perigynous, inserted with the petals; filaments filiform. *Disc* lining the receptacle. *Gynaecium* of many free carpels on a columnar receptacle, with a solitary ascending ovule in each ovary; style filiform, straight or kneeed; stigmas minute. *Fruit* a number of achenes on an elongated receptacle or sessile in the receptacle, tipped with the hardened awn-like hooked or curled styles.

Herbaceous plants with perennial rhizomes; leaves radical, imparipinnate, with the terminal segment usually largest; stem-leaves few, very often 3-foliate or bract-like; stipules adnate to the petiole; flowers terminating the branches in a scape, or often in corymbs.

Species about 71, natives of the temperate and frigid zones; 1 species in South Africa, extending from Natal to Albany; also recorded from Basutoland and Queenstown.

3375

4. *ALCHEMILLA*, Linn.

Receptacle urceolate, constricted at the throat. *Calyx-lobes* 8-10 in 2 rows; the inner valvate; the outer small. *Petals* 0. *Stamens* 1-4, inserted in the throat of the receptacle; filaments short. *Disc* lining the receptacle, with a thickened margin and closing the mouth of the receptacle. *Gynaecium* of 1-4 free carpels, sessile or sub-sessile at the base of the receptacle, with a solitary ascending ovule in each ovary; styles basal or ventral; stigmas capitate. *Fruit* of 1-2 achenes, included in the receptacle.

Annual or perennial herbs, decumbent or erect, sometimes densely leafy; leaves alternate, orbicular, lobed, digitate, or palmately-partite; stipules adnate to the petiole; flowers minute, very often in many-flowered corymbs. rarely in lax cymes or solitary; bracts 0.

Species about 122, mostly South American, but also found in India, Australia, Africa, and Madagascar; 12 species in South Africa, extending from the Transvaal and Natal, through the eastern districts to the Cape; also recorded from the Orange Free State, Basutoland and Barkly West.

3376

5. *AGRIMONIA*, Linn.

Receptacle persistent, armed with many hooked bristles or with 5 teeth, constricted at the throat. *Calyx-lobes* 5, imbricate. *Petals* 5, larger than the calyx-lobes, orbicular or oblong. *Disc* lining the receptacle, with a thickened margin. *Stamens* 5-10 or more, inserted in the mouth of the receptacle; filaments filiform. *Gynaecium* of 2 free carpels, very rarely carpels 3, sessile and included in the receptacle, with a single pendulous ovule in each ovary; styles filiform, exserted; stigmas dilated, 2-lobed. *Fruit* of 1-2 achenes, enclosed in the hardened receptacle.

Perennial herbs; leaves alternate, imparipinnate; leaflets many-jugate, incised-serrate; stipules adnate to the base of the petiole; inflorescence very often a terminal spike-like raceme; flowers small; bracts and bracteoles present.

Species about 14, natives chiefly of the north temperate zone; also found in North and South America; 1 species in South Africa, extending from the Transvaal, Natal and the eastern districts to Kongha; also recorded from Queenstown and Somerset East.

3379

6. *LEUCOSIDEA*, E. & Z.

Receptacle persistent, constricted at the throat. *Calyx-lobes* 10-12, in 2 rows; the outer short; the inner lanceolate, valvate. *Petals* 5, obovate, deciduous. *Disc* lining the receptacle, annular and almost closing the mouth of the receptacle. *Stamens* 10-12, inserted on the disc; filaments short; anthers didymous. *Gynaecium* of 2-3 free villous carpels, included in the receptacle, with a single pendulous ovule in each ovary; styles filiform, exserted; stigmas sub-clavate, channelled, hook-pointed. *Fruit* of membranous achenes, included in the receptacle.

Densely leafy shrubs or small trees, silky-villous; leaves alternate, petioled, imparipinnate; leaflets few-jugate, incised-toothed; stipules adnate to the petiole; flowers densely aggregated in shortly peduncled villous terminal spikes.

Endemic; species 1, found in the northern Transvaal, Natal, the eastern Orange Free State, Basutoland and through the eastern districts to Cathcart and Queenstown.

3381

7. *SANGUISORBA*, Linn.

Flowers bisexual, or bisexual with occasional unisexual flowers. *Receptacle* small, constricted at the throat. *Calyx-lobes* 4, petal-like, imbricate,

deciduous. *Petals* 0. *Stamens* 4 or numerous; filaments elongated. *Gynaecium* of 1-3 free carpels, included in the receptacle, with a solitary pendulous ovule in each ovary; style filiform; stigmas brush-like. *Fruit* usually a solitary leathery achene, included in the dry angled or variously roughened receptacle.

Perennial or annual herbs; leaves alternate, petioled, unequally pinnate; leaflets serrated; stipules conspicuous; flowers in dense peduncled spikes or heads; bracts present.

Species 30, natives of the north-temperate hemisphere; 1 species naturalised in South Africa.

3386

8. ACAENA, Linn.

Receptacle persistent, nude or armed with hooked or spreading spines, constricted at the throat. *Calyx-lobes* 3-7, valvate, persistent or deciduous. *Petals* 0. *Stamens* 1-10, inserted in the throat of the receptacle; filaments short, rarely elongated; anthers didymous. *Disc* lining the receptacle, annular, almost closing the mouth of the receptacle. *Gynaecium* of 1-2 free carpels, included in the receptacle, with a solitary pendulous ovule in each ovary; styles sub-terminal, short; stigmas peltate or dilated, fimbriate or penicillate. *Fruit* of 1-2 dry achenes, hidden and included in the smooth tuberculate or awned hardened receptacle.

Herbs or undershrubs, glabrous or silky; leaves alternate, imparipinnate; leaflets incised or serrate; stipules adnate to the petiole; flowers in heads at the apex of the stem, in elongated scapes, or in interrupted spikes.

Species about 150, in the temperate and frigid regions of the southern hemisphere, chiefly South America; 2 species in South Africa, found in the western and north-western districts.

3388

9. CLIFFORTIA, Linn.

Plants dioecious. *Male flowers*: *Sepals* 3, rarely 4, ovate or lanceolate, often pilose at the apex, imbricate. *Petals* 0. *Stamens* many; filaments filiform; anthers didymous. *Rudimentary carpels* 0. *Female flowers*: *Receptacle* constricted at the mouth. *Calyx-lobes* 3, rarely 4, deciduous. *Petals* 0. *Stamens* 0. *Gynaecium* of 1-2 free carpels, included in the receptacle and with a single pendulous ovule in each ovary; styles slender, exerted, plumose. *Fruit* usually of a single achene, enclosed in the hardened, rarely succulent, receptacle.

Rigid shrubs; leaves alternate, sessile or shortly petioled, 1-3-foliate, entire or toothed (often appearing simple or 1-foliate, either from the confluence of the 3 leaflets into one, or from the lateral leaflets being very minute or abortive); stipules adnate to the petiole; flowers sessile in the axils of the leaves, solitary or 2-nate.

Endemic; species 54, massed in the south-western districts, but extend on the one side to Van Rhynsdorp and in the east to Natal and the Transvaal.

3390

10. NEURADA, Linn.

Receptacle widened. *Calyx-lobes* 5, triangular, alternating with 5 subulate bracteoles. *Petals* 5, small. *Stamens* 10, inserted in the throat of the receptacle; filaments short; anthers ovoid. *Gynaecium* of 10 carpels, adhering with each other and to the receptacle, with a solitary pendulous ovule in each ovary; styles broadly subulate from the base; stigmas capitate. *Fruit* orbicular, depressed-conical, smooth at the base, spiny on the sides, of 10 horizontally spreading carpels, terminated by the spiny style.

An annual woolly herb; leaves alternate, petioled, ovate, lobed; stipules minute or obsolete; flowers solitary, axillary, pedicelled.

Species 1, native of northern Africa, Arabia, Persia, and India; naturalised in South Africa.

3391

11. GRIELUM, Linn.

Receptacle very short, adnate to the carpels. *Calyx-lobes* 5, spreading. *Petals* 5, large, inserted in the throat of the receptacle and alternating with the calyx-lobes. *Stamens* 10, inserted in the throat of the receptacle; filaments filiform-subulate; anthers oblong. *Gynaecium* of 5-10 radiating carpels, connate with each other and adnate to the receptacle, with a solitary pendulous ovule in each ovary; styles 5-10, filiform, short; stigmas capitate. *Fruit* depressed, 5-10-locular; the loculi at length opening in the axis, one-seeded.

Low annual herbs, cano-tomentose or woolly; leaves alternate, petioled, pinnately decomposed; stipules obsolete; flowers solitary, axillary, long-pedicelled.

Endemic; species 6, found in the western and north-western districts; also extending from Namaqualand to the Cape.

3393

12. PYGEUM, Gaertn.

Flowers bisexual, or occasionally bisexual with a few unisexual flowers. *Receptacle* obconic or campanulate. *Calyx-teeth* 5, 10, 12, small, deciduous leaving a narrow ring. *Petals* 5, 10, 12, or 0, inserted in the throat of the receptacle, small, often malformed or confused with the calyx-teeth. *Stamens* 10-20, inserted with the petals; filaments filiform; anthers didymous. *Ovary* superior, sessile, 1-chambered, with 2 pendulous ovules, attenuated into the style; stigma capitate. *Fruit* dry, coriaceous or succulent, often transversely oblong, one seeded.

Trees or shrubs, glabrous or tomentose; leaves alternate, petioled, entire, often with 2 glands on each side of the base; stipules small, deciduous; inflorescence an axillary and lateral solitary raceme, or racemes fascicled; flowers small.

Species about 89, natives of southern Asia, Ceylon, and the Malay Archipelago; 1 species in South Africa, extending from the northern Transvaal, Natal and eastern districts to Stutterheim; also found in the Zitzikamma and Knysna forests.

3403

13. HIRTELLA, Linn.

Receptacle short, elongated, often gibbous at the base. *Calyx-lobes* 5, sub-equal, oblong, imbricate or very rarely valvate. *Petals* 5, obovate, inserted in the throat of the receptacle, deciduous. *Stamens* 3-8 (rarely more), unilateral; filaments connate at the base into a ring, long exserted, coiled in the bud. *Ovary* inserted on one side of the receptacle-mouth, hirsute or villous, 1-chambered, with 2 ascending ovules; style filiform, elongated, basal; stigma minute. *Fruit* baccate or drupaceous, 1-seeded.

Trees or shrubs; leaves alternate, shortly petioled, ovate or oblong, entire; stipules subulate or lanceolate, caducous; inflorescence a simple or paniced axillary and terminal raceme.

Species about 64, natives of central and South America and Madagascar; 1 species recorded from Portuguese East Africa and will probably be found in the northern Transvaal.

3405

14. PARINARIUM, Juss.

Receptacle short or elongate, equal or more or less gibbous at the base; hollow or solid throughout. *Calyx-lobes* 5, obtuse and imbricate, or acute and sometimes sub-valvate. *Petals* 5, rarely 4, inserted in the mouth of the receptacle, sessile or clawed, deciduous. *Stamens* 7 to many, inserted in the throat of the receptacle, connate at the base into a short ring or into a unilateral bundle, all perfect or some without anthers; filaments subulate-filiform. *Ovary* superior, adnate to one side of the receptacle-throat, 2-chambered, with a single erect ovule in each chamber; style basal, filiform, often hirsute; stigma truncate. *Fruit* an ovoid or spherical drupe, fibrous or succulent.

Trees, rarely more or less acaulescent with underground stems; leaves alternate, entire, sometimes with 2 glands at the base; stipules subulate or lanceolate; inflorescence a corymbose-raceme or a panicle; bracteoles 2.

Species about 69, natives of tropical America, Asia, Australia, Africa; 2 species in South Africa, found in the Transvaal and Natal; a record from the Alexandria district appears to be somewhat doubtful.

84. CONNARACEÆ.

Flowers usually bisexual, sometimes with a few unisexual flowers, regular or sub-irregular. *Calyx* 5-fid or 4-5-partite, often persistent, imbricate or valvate. *Petals* 5, free or sometimes slightly connate at the middle, imbricate, very rarely valvate. *Stamens* perigynous or hypogynous, sometimes distinctly declinate, 5 or 10; those opposite the petals very often shorter and often imperfect; filaments filiform, often connate at the base. *Disc* 0 or slender, outside the base of the stamens, annular or broken. *Gynæcium* of 5, rarely 1-3, carpels; carpels free, hirsute, 1-chambered, with 2 collateral ascending ovules in each ovary; style subulate or filiform; stigma capitate, simple or 2-lobed. *Fruit* of follicles, very often solitary, sessile or stalked, 1-, very rarely 2-, seeded. *Seeds* with or without an aril; radicle remote from the hilum; endosperm present or 0.

Trees or shrubs, erect or scandent; leaves persistent or deciduous, alternate, 1-3-foliate or imparipinnate; leaflets entire; stipules 0; inflorescence a raceme or panicle.

Genera 19, species about 160, natives of the tropics and sub-tropics of the Old and New Worlds.

3428

1. CNESTIS, Juss.

Flowers unisexual, with occasional bisexual flowers. *Calyx* 5-partite; lobes sub-equal, valvate. *Petals* 5, shorter than the calyx-glabrous. *Stamens* 10, sub-equal; filaments free at the base; anthers at length recurved. *Gynæcium* of 5 carpels, sessile, with 2 ovules in each ovary; styles short; stigmas capitate. *Fruit* of 1-2 capsules, reniform or cylindric, curved or undulated, velvety on the outside, with rigid hairs on the inside, and sometimes on the outside also. *Seed* erect, sometimes with the testa somewhat fleshy downwards; embryo short; endosperm present.

Trees or shrubs; leaves imparipinnate; leaflets many-jugate, acuminate; inflorescence a raceme, rarely a panicle, or flowers solitary or fascicled, tomentose.

Species 10, natives of Africa, Madagascar, and the Malay Archipelago; 1 species in South Africa, extending from the northern Transvaal and Natal to the Transkei.

85. LEGUMINOSÆ.*

Flowers zygomorphic and often bisexual, or regular and often unisexual with occasional bisexual flowers. *Sepals* in the irregular flowers often 5, rarely 4, free, or connate into a toothed or lobed calyx; in the regular flowers 5, 4, or rarely 3 or 6, connate or free. *Petals* in the zygomorphic flowers 5 or fewer by abortion; in the regular flowers as many as the sepals. *Stamens* twice as many as the petals, more than, or rarely as many as, or fewer, sometimes indefinite; filaments free or variously connate; anthers 2-theous, generally opening by longitudinal slits. *Ovary* superior, 1-chambered, with 1 to many ovules; style simple; stigma simple. *Fruit* generally a legume, dry, fleshy or drupaceous, sometimes indehiscent, sometimes articulated. *Seeds* various; embryo with often flat cotyledons and a straight or curved radicle; endosperm 0, or scanty.

Trees, shrubs, or herbs of various habit; leaves alternate or rarely opposite, simple or pinnately or digitately compound; stipules usually present; flowers variously arranged; floral bracts 2, various, very rarely absent.

Genera about 489; species about 11,000, distributed all over the world, somewhat rare in New Zealand.

Suborder Mimoseæ: Petals valvate, often connate below the middle; stamens free or joined (genera 1-10).

Tribe **Ingeæ**: Calyx valvate; stamens indefinite, monadelphous (genera 1-2).

Tribe **Acaciæ**: Calyx valvate; stamens indefinite, free (genus 3).

Tribe **Eumimoseæ**: Calyx valvate; stamens as many as or twice as many as the petals, free; anthers without glands (genera 4-5).

Tribe **Adenanthereæ**: Calyx valvate; stamens twice as many as the petals, rarely as many; anthers often terminated by a stalked gland (genera 6-10).

Suborder Caesalpinieæ: Petals imbricate, with the uppermost interior; stamens often free (genera 11-28).

Tribe **Dimorphanthereæ**: Leaves bipinnate, paripinnate, or very rarely imparipinnate; flowers small, arranged in spikes; calyx gamosepalous beyond the disc; ovules many (genera 11-12).

Tribe **Cynometreæ**: Leaves paripinnate, 2 to many-foliate; ovules 1-2; flowers often small (genus 13).

Tribe **Amherstieæ**: Leaves paripinnate, rarely imparipinnate, 3 to many- or very rarely 1-foliate; ovary stalked, with the stalk adnate to the calyx-tube; ovules 3 to many (genera 14-17).

Tribe **Bauhinieæ**: Leaves simple, entire or 2-lobed or rarely 2-foliate; calyx gamosepalous above the disc; ovary-stalk free or adnate to the calyx-tube; ovules 2 to many (genus 18).

Tribe **Cassieæ**: Leaves impari- or paripinnate; ovary-stalk free in the calyx-tube; anthers usually opening by pores or slits, erect, basifixed, never versatile (genera 19-21).

Tribe **Eucæsalpineæ**: Leaves often bipinnate; ovary-stalk free in the calyx-tube; ovules many or rarely 1-2 (genera 22-28).

Suborder Papilionaceæ: Calyx gamosepalous; petals imbricate, with the uppermost exterior (genera 29-116).

Tribe **Swartsieæ**: Trees or tall shrubs; leaves pinnately 5 to many-, rarely 3-1-, foliate; calyx almost always at first entire; stamens many, rarely about 10, free (genus 29).

Tribe **Sophoreæ**: Trees, tall shrubs, or high climbers, very rarely herbaceous or small shrubs; leaves pinnately 5 to many-foliate, or large and 1-foliate, rarely 3-foliate; stamens 10, free (genera 30-34).

Tribe **Podalyrieæ**: Shrubs, rarely herbs; leaves simple or digitately compound; stamens 10, free (genera 35-36).

*Hutchinson (The family of Flowering Plants) adopts the old family name (Leguminosæ) for an order under which he includes the three families Caesalpinieæ, Mimoseæ, Papilionaceæ (Fabaceæ).

- Tribe **Genistæ** : Shrubs or herbs ; leaves simple or digitately compound ; leaflets entire ; flowers in terminal racemes, or the racemes opposite the leaves, or the flowers solitary or sub-fascicled in the leaf-axils ; stamens 10, monadelphous, rarely diadelphous (genera 37-60).
- Tribe **Trifoliæ** : Herbs, very rarely shrubby ; leaves pinnately, rarely digitately, 3-foliolate ; veins of leaflets often produced into teeth ; flowers solitary or in racemes ; peduncles axillary, rarely crowded at the ends of the branches ; stamens 10, diadelphous or monadelphous (genera 51-64).
- Tribe **Loteæ** : Herbs or undershrubs ; leaves pinnately 3 to many-foliolate ; leaflets entire ; flowers in heads or umbels, rarely solitary ; peduncles axillary or crowded at the ends of the branches ; stamens 10, diadelphous or monadelphous ; alternate filaments often dilated at the apex (genus 65).
- Tribe **Galegæ** : Herbs, not twining, or erect shrubs, or rarely trees, or high scandent shrubs ; leaves pinnately 5 to many, rarely 3-1, -foliate ; leaflets often entire ; tendrils absent ; flowers solitary or in racemes or panicles ; stamens 10, diadelphous, or if monadelphous then the vexillary stamen free at the base ; legume 2-valved, or if indehiscent then small, 1-2-seeded or membranous-inflated (genera 66-79).
- Tribe **Hedysaræ** : Habit of species in tribes *Loteæ*, *Galegæ*, or *Phaseolæ*, but the pod articulated (genera 80-91).
- Tribe **Dalbergiæ** : Trees, tall shrubs, or high climbers ; leaves pinnately 5 to many-foliolate, very rarely 3-1-foliolate ; inflorescence various, often paniced or in fascicled racemes ; stamens monadelphous or diadelphous ; legume exserted, indehiscent, membranous, leathery, woody, or drupaceous (genera 92-94).
- Tribe **Viciæ** : Herbs ; leaves paripinnate ; leaf-rachis terminating in a bristle or tendril ; leaflets often denticulate at the apex ; stamens and legume as in tribe *Phaseolæ* (genera 95-98).
- Tribe **Phaseolæ** : Twining herbs, rarely erect and shrubby, very rarely trees ; leaves pinnately, very rarely sub-digitately, 3-foliolate, rarely 1-5-7-foliolate ; leaflets entire or lobed, very often stipellate ; flowers in racemes or fascicled ; peduncle often axillary ; stamens diadelphous or sub-monadelphous ; legume 2-valved (genera 99-116).
1. Petals valvate in bud ; flowers regular (*Mimosoideæ*) 2
 - Petals imbricate in bud or wanting ; flowers more or less irregular 11
 2. Stamens numerous 3
 - Stamens 10 or 20, rarely less than 10 5
 3. Filaments connate into a distinct tube 4
 - Filaments free, or connate at the base into a very short cup or disc 3. *Acacia*, *Willd.*
 4. Pod annular, falcate, or spirally twisted 1. *Pithecolobium*, *Mart.*
 - Pod straight or almost so 2. *Albizzia*, *Durazz.*
 5. Lower portion of inflorescence bearing neuter flowers which are often differently coloured from the upper bisexual flowers 6. *Dichrostachys*, *W. & A.*
 - Inflorescence not partly of neuter flowers 6
 6. Anthers without apical glands 7
 - Anthers (at least in the bud) with apical glands which are sometimes caducous, rarely without glands but then pod indehiscent 8
 7. Pod 2-valved ; the valves not separating from the persistent sutures 4. *Leucaena*, *Benth.*
 - Pod 2-valved ; the valves separating from the persistent sutures, or sometimes transversely articulate 5. *Mimosa*, *Linn.*
 8. Ovary with 1-2 ovules 7. *Xerocladia*, *Harv.*
 - Ovary with many ovules 9
 9. Pods breaking transversely into 1-seeded portions 10. *Entada*, *Adans.*
 - Pods 2-valved or indehiscent 10
 10. Pod thick-compressed or sub-terete, indehiscent 8. *Prosopis*, *Linn.*
 - Pod flattened, with the valves separating from the persistent sutures 9. *Elephantorrhiza*, *Benth.*
 11. Petals 1-6 or 0 ; the posterior petal innermost in bud ; petals not forming a papilionaceous corolla (*Cæsalpinioidææ*) 12
 - Petals 5 ; the posterior petal outermost in bud ; the petals forming a papilionaceous corolla (*Papilionaceæ*) 31

12. Leaves pinnate, usually with more than 2 leaflets, more rarely leaflets only 2, or leaves simple, entire or 2-lobed 13
Leaves bipinnate 24
13. Leaflets 2, or leaves simple, entire or 2-lobed 14
Leaflets more than 2 15
14. Petals 0; calyx of 4-5 segments 13. *Copaifera*, Linn.
Petals 5; calyx spathaceous 18. *Bauhinia*, Linn.
15. Stamens many 29. *Swartzia*, Schreb.
Stamens 2-10 16
16. Calyx-segments 4 17
Calyx-segments usually 5, sometimes 5-7, rarely 1 or 0, but then petals 0 18
17. Petals 5; stamens 10 15. *Schotia*, Jacq.
Petal 1; stamens 3-8 17. *Azelia*, Smith
18. Filaments villous at the base 19
Filaments glabrous 20
19. Leaf-rhachis ending in a spine; ovules many 23. *Parkinsonia*, Linn.
Leaf-rhachis not ending in a spine; ovules 2-3 24. *Haematoxylon*, Linn.
20. Ovary with 2 ovules 21
Ovary with more than 2 ovules 22
21. Strongly armed trees; flowers in panicles 16. *Umtiza*, Sim.
Unarmed trees; flowers in paniced cymes 20. *Dialium*, Linn.
22. Petals 5; anthers usually opening by terminal pores or apical slits 21. *Cassia*, Linn.
Petals 0; anthers opening by longitudinal slits 23
23. Stamens 10, united at the base 14. *Brachystegia*, Benth.
Stamens 5, free; stigma peltate 19. *Ceratonia*, Linn.
24. Stigma broadly peltate 28. *Peltophorum*, Vog.
Stigma not peltate 25
25. Ovary with 1 ovule; fruit produced at the apex into a wing 25. *Pterolobium*, R. Br.
Ovary with 2 or more ovules; fruit not winged 26
26. Flowers unisexual and bisexual 22. *Gleditschia*, Linn.
Flowers bisexual 27
27. Ovary with 2-3 ovules 28
Ovary with more than 3 ovules, if less then the flowers large and showy 29
28. Filaments glabrous 12. *Burkea*, Benth.
Filaments pilose at the base 24. *Haematoxylon*, Linn.
29. Flowers usually large and showy; filaments declinate 27. *Cæsalpinia*, Linn.
Flowers medium-sized or small; filaments not or slightly declinate 30
30. Large trees; leaflets usually large and leathery 11. *Erythrophleum*, Afzel.
Herbs or low undershrubs; leaflets small 26. *Hoffmannseggia*, Cav.
31. Leaves simple, very rarely 2-foliolate or absent 32
Leaves pinnately or digitately foliate 70
32. Leaves rudimentary, apparently absent 33
Leaves developed, simple, rarely 2-foliolate 34
33. Keel spurred or gibbous 67. *Indigofera*, Linn.
Keel not spurred nor gibbous 58. *Cytisus*, Linn.
34. Leaves 2-foliolate 35
Leaves simple 36
35. Pod dividing transversely into segments; rhachis not produced into a tendril or bristle 87. *Zornia*, Gmel.
Pod 2-valved; rhachis produced into a bristle or tendril 95. *Vicia*, Linn.
36. Stamens free, or connate at the base only 37
Stamens diadelphous, or in 2 bundles of 5 each, or monadelphous, sometimes the staminal-tube short 38
37. Flowers in racemes or panicles; ovary 2-4-ovuled 34. *Baphia*, Afzel.
Flowers solitary, or 2-4-nate on axillary peduncles; ovary many-ovuled 36. *Podalyria*, Lam.

38. Stamens diadelphous, or rarely divided into 2 bundles by the
staminal-tube splitting on either side 39
Stamens monadelphous 52
39. Keel spurred or gibbous on either side, or with a membranous appen-
dage on one or both sides, if appendage not obvious then the
calyx brown, tubular, long ciliate at the apex and almost
equalling the petals, never gland-dotted 40
Keel without appendages 43
40. Keel with a membranous appendage on one or both sides; pod
dividing into segments 90. *Alysicarpus*, Neck.
Keel gibbous or spurred; pod 2-valved 41
41. Flowers in umbels, rarely solitary; the alternate filaments expanded
at the apex; anthers uniform 65. *Lotus*, Linn.
Flowers in spikes or racemes; filaments not expanded above;
anthers uniform or unequal 42
42. Keel darkly tinted; anthers unequal 39. *Amphithalea*, E. & Z.
Keel not darkly tinted; anthers uniform 67. *Indigofera*, Linn.
43. Trees or tall climbing shrubs; inflorescence a dichotomous cyme
or an irregular sub-corymbose panicle 92. *Dalbergia*, Linn. f.
Herbs, shrubs, or undershrubs; flowers solitary, or in spikes,
racemes, heads, or umbels 44
44. The lowest calyx-lobe broad and petaloid 37. *Liparia*, Linn.
The lowest calyx-lobe equalling or sub-equalling the others, or
longer and narrower, not broad and petaloid 45
45. Pod enclosed in the calyx; ovule 1, rarely ovules 2 46
Pod exerted from the calyx; ovules 1 to many 47
46. Leaves and calyx gland-dotted 68. *Psoralea*, Linn.
Leaves and calyx not gland-dotted 91. *Hallia*, Thunb.
47. Keel spirally contorted with the filaments and style 73. *Bolusia*, Benth.
Keel straight or incurved, not spirally contorted 48
48. Rigid, usually spinous, shrubs; rhachis of raceme ending
in a spine 81. *Alhagi*, Desv.
Rhachis of raceme not ending in a spine 49
49. Bracts large, ovate, lanceolate, or the inner setaceous; stipules
none 38. *Priestleya*, DC.
Bracts subulate, minute, or 0, sometimes ovate-spathaceous;
stipules present 50
50. Flowers small, axillary, usually in pairs 69. *Sylitra*, E. Mey.
Flowers in racemes 51
51. Standard silky or villous without; pod leathery 70. *Tephrosia*, Pers.
Standard glabrous; pod membranous 74. *Microcharis*, Benth.
52. Trees or high climbing shrubs; flowers in dichotomous cymes or
in irregular sub-corymbose panicles 92. *Dalbergia*, Linn. f.
Herbs, shrubs, or undershrubs; flowers solitary, in racemes, spikes,
heads, or umbels 53
53. Keel spurred or gibbous on either side 54
Keel not spurred nor gibbous, if with a minute pocket then the
leaves pungent 58
54. Glabrous shrubs, rarely villous, if so then the leaves not ericoid 55
Villous shrubs with ericoid leaves, or leaves narrow with revolute
margins 56
55. Leaves 3- to many-nerved 43. *Borbonia*, Linn.
Leaves with a single main nerve 44. *Rafnia*, Thunb.
56. Flowers in heads, or sub-sessile, axillary, solitary, rarely 2-flowered
on a long peduncle; ovule 1 57
Flowers solitary, pedicelled, axillary; ovules 2 42. *Walpersia*, Harv.
57. Flowers in terminal leafy heads 40. *Lathriogyne*, E. & Z.
Flowers axillary, solitary or 2-nate 41. *Coelidium*, Vog.
58. Anthers uniform 59
Anthers unequal 63

59. Pod hidden in the calyx 60
 Pod exerted from the calyx 61
60. Calyx and leaves gland-dotted 68. *Psoralea*, *Linn.*
 Calyx and leaves not gland-dotted 91. *Hallia*, *Thunb.*
61. Flowers small, axillary, usually in pairs 69. *Sylitra*, *E. Mey.*
 Flowers in racemes 62
62. Standard silky or villous without; pods leathery 70. *Tephrosia*, *Pers.*
 Standard glabrous; pods membranous 74. *Microcharis*, *Benth*
63. Keel strongly beaked; pods inflated or turgid 56. *Crotalaria*, *Linn.*
 Keel not strongly beaked; pods compressed or terete, rarely pods
 turgid 64
64. Seed with an outgrowth at the hilum 58. *Cytisus*, *Linn.*
 Seed without an outgrowth at the hilum 65
65. Calyx-lobes unequal; the lowest 1-3 usually narrower than the others 66
 Calyx-lobes equal 69
66. Pod turgid; flowers in a dense terminal sub-capitate raceme
 45. *Euchlora*, *E. & Z.*
 Pod more or less compressed; flowers solitary, or in racemes,
 spikes, or umbels 67
67. Pod semi-ovate or semi-lanceolate, oblique at the base
 52. *Aspalathus*, *Linn.*
 Pod oblong, linear, or lanceolate, not oblique at the base 68
68. Glabrous, often glaucous, plants; stipules 0 44. *Rafnia*, *Thunb.*
 Usually hairy plants; stipules present 47. *Lotononis*, *E. & Z.*
69. Leaves sessile 43. *Borbonia*, *Linn.*
 Leaves more or less distinctly stalked 50. *Lebeckia*, *Thunb.*
70. Leaves pinnately foliate, with more than 3 leaflets 71
 Leaves pinnately 3-foliate, or digitately 3 to many-foliate, or leaves
 fascicled 99
71. Stamens free or sometimes connate at the base 72
 Stamens diadelphous or monadelphous, rarely with the staminal-
 tube split on either side so that stamens appear in 2 bundles of
 5 each, very rarely stamens 9 owing to the absence of the
 vexillary stamen 75
72. Calyx shortly toothed; pod terete or nearly so, constricted between
 the seeds 30. *Sophora*, *Linn.*
 Calyx shortly 2-lipped, or the 2 upper lobes more or less connate;
 pod compressed 73
73. Calyx 2-lipped; the upper lip 2-toothed; the lower lip 3-toothed;
 ovary sessile; flowers pink 33. *Virgilia*, *Lam.*
 Two upper calyx-lobes more or less connate; ovary stalked or sub-
 sessile; flowers yellow or blue 74
74. Two upper calyx-lobes partly connate; ovary stalked; flowers
 yellow 31. *Calpurnia*, *E. Mey.*
 Two upper calyx-lobes connate high up; ovary sub-sessile;
 flowers blue 32. *Bolusanthus*, *Harms*
75. Keel gibbous or spurred on either side 76
 Keel not gibbous nor spurred 77
76. Stamens 10, diadelphous 67. *Indigofera*, *Linn.*
 Stamens 9, monadelphous 98. *Abrus*, *Linn.*
77. Common leaf-rhachis ending in a bristle or tendril 78
 Leaf-rhachis not ending in a bristle or tendril 81
78. Stamens 9 98. *Abrus*, *Linn.*
 Stamens 10 79
79. Style hairy under the stigma; mouth of the staminal-tube obliquely
 truncate 95. *Vicia*, *Linn.*
 Style bearded on the inner face; mouth of the staminal-tube
 equally truncate 80
80. Style flattened 96. *Lathyrus*, *Linn.*
 Style laterally compressed, with reflexed margins forming a dis-
 tinct groove 97. *Pisum*, *Linn.*

81. Style bearded above; pod membranous and sub-dehiscient, or
leathery and 2-valved 82
Style glabrous; pod various, not membranous 84
82. Petals silky or villous without; pod leathery, 2-valved
70. *Tephrosia*, Pers.
Petals glabrous; pods membranous, sub-dehiscient 83
83. Flowers bright red, very large and showy; keel somewhat acute,
exceeding the standard 76. *Sutherlandia*, R. Br.
Flowers medium-sized; keel obtuse, usually shorter than the
standard 77. *Lessertia*, D C.
84. Flowers arranged in dichotomous cymes, or in irregular sub-
corymbose panicles 92. *Dalbergia*, Linn. f.
Flowers solitary or in racemes; the racemes sometimes paniced 85
85. Leaves and calyx gland-dotted; ovule usually 1, very rarely
ovules 2 68. *Psoralea*, Linn.
Leaves and calyx not gland-dotted; ovules 2 to many 86
86. Pod breaking up into joints 87
Pod 2-valved or indehiscent 90
87. Pod enclosed in the calyx 84. *Smithia*, Linn.
Pod exceeding the calyx 88
88. Stamens diadelphous 80. *Hedysarum*, Linn.
Stamens monadelphous, or the staminal-tube sometimes split on
both sides to form 2 bundles each of 5 stamens 89
89. Segments of pod narrowed at each end 82. *Ormocarpum*, Beauv.
Segments of pod square or rounded 83. *Aeschynomene*, Linn.
90. Anther-thecae confluent at the apex; the alternate anthers smaller,
opening deeply into two unequal halves 79. *Glycyrrhiza*, Linn.
Anther-thecae not confluent at the apex 91
91. Pod indehiscent 92
Pod 2-valved 93
92. Calyx toothed or lobed, with the 2 upper teeth more or less con-
nate; pod with a membranous or sharp ridge 93. *Pterocarpus*, Linn.
Calyx truncate, with the teeth very short or obsolete; pod not
winged, but the upper suture sometimes dilated
94. *Lonchocarpus*, H.B. & K.
93. Petals hairy 94
Petals glabrous 96
94. Wings free from the keel 72. *Millettia*, Wight & Arn.
Wings slightly adhering to the keel 95
95. Herbs or undershrubs, rarely shrubs 70. *Tephrosia*, Pers.
Shrubs or small trees, silky-pubescent 71. *Mundulea*, D C.
96. Pod septate between the seeds, or incompletely or completely
divided longitudinally into 2 loculi by the introflexion of the
cardinal suture. 97
Pod not septate within nor longitudinally divided
72. *Millettia*, W. & A.
97. Pod divided longitudinally into two compartments
78. *Astragalus*, Linn.
Pod septate between the seeds 98
98. Stamens diadelphous 75. *Sesbania*, Pers.
Stamens monadelphous or more or less diadelphous
100. *Glycine*, Linn.
99. Leaves pinnately or digitately 3-foliolate 100
Leaves digitately 4 to many-foliolate, or fascicled 170
100. Stamens monadelphous, very rarely free or connate at the base only 101
Stamens diadelphous, rarely joined at the middle 134
101. Stamens free or connate at the base 35. *Cyclopia*, Vent.
Stamens monadelphous 102
102. Leaves digitately 3-foliolate; anthers unequal, very rarely anthers
equal, if so then the leaves and calyx gland-dotted, or the 4
lower petals or all the petals adnate to the staminal-tube and
the pod enclosed in the calyx 103

- Leaves pinnately 3-foliolate ; anthers uniform, very rarely anthers unequal, if so then stamens and petals inserted in the throat of the calyx-tube, or the alternate anthers abortive, very rarely with the anther-thecae confluent at the apex 119
103. Petals free from the staminal-tube 104
 Petals all, or 4 lower only, adnate to the staminal-tube 64. *Trifolium*, Linn.
104. Leaves and calyx gland-dotted ; ovule 1, very rarely ovules 2 68. *Psoralea*, Linn.
 Leaves and calyx not gland-dotted ; ovules many 105
105. Pod stalked, indehiscent, winged on the upper suture, sharp and thin along the lower 51. *Wiborgia*, Thunb.
 Pod 2-valved, compressed, terete, or turgid 106
106. Pod folded and twisted from side to side ; the 4 upper calyx-lobes approximate in pairs 49. *Listia*, E. Mey.
 Pod not folded and twisted 107
107. Pod constricted between the seeds ; petals not much longer than the calyx 55. *Melolobium*, E. & Z.
 Pod not constricted ; petals much exceeding the calyx 108
108. Keel and style straight 109
 Keel and style curved 110
109. Flowers in terminal or axillary capitate spikes ; stipules free 46. *Phænohoffmannia*, O. Kuntze
 Flowers in congested or lax terminal racemes ; stipules none 48. *Pearsonia*, Dummer
110. Calyx intruse at the base 111
 Calyx not intruse at the base 112
111. Keel shorter than the standard 59. *Hypocalyptus*, Thunb.
 Keel longer than the standard 60. *Loddigesia*, Sims
112. Keel very distinctly beaked ; pod turgid 56. *Crotalaria*, Linn.
 Keel not distinctly beaked ; pod usually compressed, more rarely turgid 113
113. The two upper calyx-lobes free or connate ; 3 lower lobes connate into a 3-toothed or 3-fid lip 57. *Argyrolobium*, E. & Z.
 Calyx sub-equally lobed, more or less 2-lipped, or the four upper lobes approximate in pairs 114
114. Staminal-tube closed above 58. *Cytisus*, Linn.
 Staminal-tube slit above 115
115. Leaves sessile or sub-sessile ; fruit obliquely ovate at the base 52. *Aspalathus*, Linn.
 Leaves more or less distinctly petioled ; fruit linear, lanceolate, oblong, or ovate, not oblique at the base 116
116. Fruit ovate ; stipules foliaceous 53. *Buchenroedera*, E. & Z.
 Fruit linear, lanceolate, or oblong ; stipules small, foliaceous, or 0 117
117. Calyx 2-lipped ; the upper lip 2-toothed ; the lower lip 3-toothed 54. *Dichilus*, D C.
 Calyx-lobes equal or unequal, not 2-lipped 118
118. Calyx-lobes unequal ; funicle filiform 47. *Lotononis*, E. & Z.
 Calyx-lobes equal ; funicle very short 50. *Lebeckia*, Thunb.
119. Petals and stamens inserted in the throat of the calyx-tube ; style breaking near the base and forming a hook 85. *Stylosanthes*, Swartz
 Petals and stamens not inserted in the calyx-throat 120
120. Leaf-rhachis produced into a tendril or bristle 97. *Pisum*, Linn.
 Leaf-rhachis not produced into a tendril or bristle 121
121. Anthers-thecae confluent at the apex, or the alternate anthers abortive 122
 Anthers all uniform 123
122. Perennial herbs ; wings free from the keel ; anther-thecae confluent at the apex 79. *Glycyrrhiza*, Linn.
 Twining herbs ; wings adnate to the keel ; alternate anthers abortive 102. *Teramnus*, Swartz

123. Stipules adnate to the petiole 124
 Stipules free from the petiole 125
124. Flowers in long, more or less spike-like, racemes; ovules few
 63. Melilotus, Juss.
 Flowers solitary, or in short racemes, heads, or umbels; ovules
 many **61. Trigonella, Linn.**
125. Pods deeply constricted between the seeds, or dividing transversely
 into separate segments 126
 Pods 2-valved, never deeply constricted between the seeds 127
126. Pods deeply constricted between the seeds . . . **103. Erythrina, Linn.**
 Pods separating into segments **88. Desmodium, Desv.**
127. Calyx 2-lipped **107. Canavalia, D C.**
 Calyx sub-equally toothed, or lobed, or the 2 upper lobes more
 or less connate 128
128. Pod with a distinct acuminate beak **66. Cyamopsis, D C.**
 Pod not beaked 129
129. Stipules herbaceous **106. Pueraria, D C.**
 Stipules small or inconspicuous 130
130. The 2 upper calyx-segments completely connate . **105. Galactia, P.Br.**
 The 2 upper calyx-segments not completely connate 131
131. Prostrate or twining herbs 132
 Herbs, undershrubs, or trees, rarely tall shrubs 133
132. Style beardless **100. Glycine, Linn.**
 Style bearded on the inner side **115. Vigna, Savi.**
133. Herbs or undershrubs, rarely shrubs; pods 2-valved
 70. Tephrosia, Pers.
 Trees or tall climbing shrubs; pods indehiscent
 94. Lonchocarpus, H.B. & K.
134. Leaves digitately 3-foliolate 135
 Leaves pinnately 3-foliolate 144
135. Keel spirally contorted with the style and stamens; anthers
 unequal **73. Bolusia, Benth.**
 Keel not spirally contorted 136
136. Pods divided transversely into segments . . . **90. Alysicarpus, Neck.**
 Pods 2-valved 137
137. Standard eared at the base 138
 Standard not eared at the base 142
138. Style bearded above 139
 Style glabrous 140
139. Flowers dimorphic; the bisexual flowers sterile; the female
 flowers without petals **114. Voandzeia, Thouars**
 Flowers perfect **116. Dolichos, Linn.**
140. Ovary with about 4 ovules **101. Neorautanenia, Schinz**
 Ovary with 1-2 ovules 141
141. Calyx campanulate, mostly oblique, 4-5-fid; the 2 upper lobes
 more or less united; the lowest lobe the longest **110. Rhynchosia, Lour.**
 Calyx-lobes sub-equal, or the lowest longer, free, often falcate
 112. Flemingia, Roxb.
142. Keel gibbous or spurred **67. Indigofera, Linn.**
 Keel not spurred 143
143. Leaves and calyx gland-dotted **68. Psoralea, Linn.**
 Leaves and calyx not gland-dotted **64. Trifolium, Linn.**
144. Style bearded 145
 Style beardless 148
145. Two upper calyx-segments completely fused . . **116. Dolichos, Linn.**
 Two upper calyx-segments sometimes more or less connate,
 but not completely fused 146
146. Beak of keel spirally contorted with the style and stamens
 113. Phaseolus, Linn.
 Keel not spirally contorted 147

147. Standard eared at the base 115. *Vigna*, *Savi*.
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3441

1. PITHECOLOBIUM, Mart.

Flowers 5- rarely 6-merous, bisexual, rarely unisexual with a few bisexual flowers. *Calyx* campanulate or tubular, shortly toothed. *Corolla* tubular or funnel-shaped. *Stamens* many, often numerous, rarely few, long exserted, connate into a tube round the ovary. *Ovary* sessile or stalked, with many ovules; style filiform; stigma terminal, small or capitate. *Pod* flattened, annular, falcate, or spirally twisted, leathery, thick, or sub-fleshy, rarely indehiscent or breaking into segments. *Seeds* ovate or orbicular, with a filiform funicle.

Shrubs or trees, unarmed, or with spinescent stipules, or armed with axillary spines; leaves bipinnate, with the leaflets sometimes small and many-jugate, sometimes large and few-jugate, sometimes 3-2- or 1-foliate, usually with a gland on the petiole below the pinnæ and others between or below some or all of the pinnæ and leaflets; stipules sometimes small or inconspicuous, sometimes persistent, hardened or spinescent; peduncle solitary or sub-fascicled, axillary, or in racemes, or fascicled at the apex of the branches; flowers in globose or rarely oblong or cylindric spikes.

Species about 222, found in tropical America, Asia, Africa, and Australia. One species occurs near Delagoa Bay, but probably not native.

3443

2. ALBIZZIA, Durazz.

(Zygia, Benth.)

Flowers often 5-merous, bisexual, rarely unisexual with a few bisexual flowers. *Calyx* campanulate or tubular, toothed or shortly lobed. *Corolla* funnel-shaped. *Stamens* many, exserted, connate into a tube. *Pod* flattened, straight, indehiscent or 2-valved. *Seeds* ovate or orbicular, compressed, with a filiform funicle.

Shrubs or trees, unarmed; leaves bipinnate, with the leaflets small and many-jugate, or ample and few-jugate; the glands on the petiole and pinnæ more or less conspicuous; stipules setaceous or obsolete, or rarely large and membranous; peduncle axillary, paniculate at the apices of the branches; flowers in globose heads or in cylindric spikes.

Species about 100, found in the warmer regions of Asia, Africa, and Australia; 2 species often cultivated in India; 8 species in South Africa, found in the Transvaal and Natal.

3446

3. ACACIA, Willd.

Flowers 5-4-merous, rarely 3-merous, often sessile, bisexual, rarely unisexual with a few bisexual flowers. *Calyx* campanulate, toothed, lobed, or sepals distinct, rarely absent. *Petals* more or less joined, or rarely free, very rarely none. *Stamens* many (often more than 50), exserted, free, or connate at the base into a very short cup or into a very short and irregular perigynous disc. *Ovary* sessile or stalked, 2 to many-ovuled; style filiform; stigma terminal, small. *Pod* ovate, oblong, or linear, straight, eurved, or variously contorted, flat, convex, or terete, membranous, coriaceous, or woody, 2-valved or indehiscent. *Seed* compressed, with a filiform funicle, or with the funicle variously dilated into a fleshy aril.

Trees or shrubs, or very rarely herbs, unarmed, thorny, or spiny; leaves bipinnate; the leaflets often small and many-jugate or with the petiole expanded to form (in the Australian species) phyllodes, with glands often present on the petiole; stipules spinescent or inconspicuous, rarely membranous; flowers in globose heads or in cylindric spikes; peduncles axillary, solitary or fascicled, or panicle at the apex of the branches.

Species about 676, chiefly found in Australia and Africa; 38 species native in South Africa, widely dispersed over the Union, but chiefly in the Transvaal, Natal, Bechuanaland and S. W. Africa, absent from the south-western districts except for one species which may not be indigenous there. Many Australian species are cultivated and some naturalised in South Africa.

3447

4. LEUCAENA, Benth.

Flowers 5-merous, sessile, mostly bisexual. *Calyx* tubular-campanulate, toothed. *Petals* free. *Stamens* 10, free, exserted; anthers often pilose, eglandular. *Ovary* stalked, many-ovuled; style filiform; stigma terminal. *Legume* stalked, broadly linear, plano-compressed, rigidly membranous, 2-valved. *Seeds* ovate, compressed.

Unarmed trees or shrubs; leaves bipinnate; leaflets sometimes small and many-jugate, sometimes large and few-jugate, oblique, with the petiole often glandular; stipules setaceous or small; flowers white, in globose heads; peduncles axillary and sub-fascicled, or the upper arranged in terminal leafless racemes.

Species 33, found in the warmer parts of America and the Pacific Islands; one species found cultivated in South Africa.

3449

5. MIMOSA, Linn.

Flowers 4-5-merous, rarely 3- or 6-merous, bisexual, or unisexual with a few bisexual flowers. *Calyx* often minute, almost inconspicuous, rarely campanulate, shortly toothed. *Petals* more or less connate, valvate. *Stamens* twice the number of the petals, or more, or equalling the petals in number, free, exserted; anthers without glands. *Ovary* sessile or rarely stalked, 2 to many-ovuled; style filiform; stigma small, terminal. *Pod* oblong or linear, compressed or rarely thickened, membranous or leathery, sometimes transversely articulated. *Seeds* ovate or orbicular, flat.

Herbs, shrubs, rarely scandent or trees, unarmed or prickly; leaves bipinnate, often sensitive, very rarely 0, or the petiole reduced to a phyllode; glands sometimes present on the petioles; flowers in globose heads or in cylindric spikes; peduncles axillary, solitary, or fascicled.

Species about 400, in tropical and sub-tropical America, Asia, Africa, and Australia; a few species cultivated in South Africa.

3452

6. *DICHROSTACHYS*, Wight & Arn.

Flowers 5-merous, sessile; the upper bisexual; the lower neuter. *Calyx* campanulate, shortly toothed. *Petals* valvate, cohering below the middle. *Stamens* in the bisexual flowers 10, free, shortly exerted; anthers with stalked glands. *Ovary* sub-sessile, many-ovuled; style filiform; stigma terminal, truncate. (In the neuter flowers staminodes 10, long, filiform; ovary rudimentary, small). *Pod* linear, compressed, contorted, coriaceous, indehiscent or irregularly dehiscent along the sutures. *Seeds* obovate, compressed.

Shrubs; branches here and there abbreviated or spiny and leafless; leaves bipinnate; leaflets often small and many-jugate; spikes cylindric, peduncled, solitary or clustered, often drooping; the upper bisexual flowers yellow; the lower neuter flowers rosy or purple.

A genus of about 11 species, found in Africa and Asia and also in Australia; 3 species found in the Transvaal and Natal.

3453

7. *XEROCLADIA*, Harv.

Flowers 5-merous, sessile. *Calyx* campanulate, shortly toothed. *Petals* valvate, cohering below the middle. *Stamens* 10, free, shortly exerted; anthers with minute deciduous glands at the apex. *Ovary* sessile, 1- (or 2-) ovuled; style filiform; stigma terminal, small. *Pod* sessile, broadly falcate-ovate or semi-orbicular, plano-compressed, 1-seeded; with the lower suture arched and winged. *Seeds* ovate, compressed.

A rigid shrub, with recurved spinescent stipules; leaves few, small, bipinnate, with the pinnae 1-2-jugate; leaflets small, few-jugate; flowerheads globose-capitate, shortly peduncled and axillary.

Endemic; species 1, found in Namaqualand.

3454

8. *PROSOPIS*, Linn.

Flowers 5-merous, often sessile. *Calyx* campanulate, shortly toothed. *Petals* valvate, connate below the middle or at length free. *Stamens* 10, free, shortly exerted; anthers with deciduous glands at the apex, rarely without glands. *Ovary* sessile or stalked, many-ovuled; style filiform; stigma terminal, small. *Legume* linear, thick-compressed or sub-terete, straight, falcate, or variously twisted, coriaceous, indehiscent. *Seeds* often ovate, compressed.

Armed or unarmed trees or shrubs; leaves bipinnate; the pinnae 1-2- or rarely many-jugate; the leaflets few or many-jugate, often rigid; stipules small or 0, sometimes spinescent; glands on petiole and pinnae small or obscure, rarely 0; flowers small, in a cylindric spike, rarely in a globose head; peduncles axillary.

Species about 38, found in tropical and sub-tropical countries; one species cultivated in South Africa.

3467

9. *ELEPHANTORRHIZA*, Benth.

Flowers 5-merous, shortly pedicelled. *Calyx* campanulate, shortly toothed. *Petals* valvate, cohering below the middle, at length free. *Stamens* 10, free, shortly exerted; anthers with deciduous glands at the apex. *Ovary* sessile, many-ovuled, glabrous; style filiform; stigma terminal, small. *Pod* somewhat straight, flattened, with the sutures remaining closed, but the long-persisting rigid valves separating. *Seeds* orbicular, compressed.

Shrubs, sometimes almost acaulescent and with very much thickened underground stems; leaves bipinnate; leaflets small, many-jugate; petioles without glands; flowers in cylindric racemes or sub-spikes; peduncles sometimes axillary or sometimes in a short leafless scape.

An African genus of 7 species; 5 species found in the Transvaal, Natal and S. W. Africa.

3468

10. ENTADA, Adans.

Flowers 5-merous, sessile. *Calyx* campanulate, very short-toothed. *Petals* valvate, free or slightly cohering. *Stamens* 10, free, shortly exserted; anthers tipped with deciduous glands. *Ovary* sub-sessile, many-ovuled; style filiform; stigma terminal, small. *Pod* straight or curved, sometimes large, compressed, coriaceous or woody, breaking up into 1-seeded indehiscent portions. *Seeds* orbicular.

Unarmed or armed shrubs, very often scandent; leaves bipinnate; the uppermost pair of pinnæ often changed into tendrils; leaflets sometimes large and few, or small and numerous; stipules small, setaceous; glands on petioles 0; flowers in slender spikes.

Species about 28, natives of Africa and tropical America: 2 species found in the Transvaal and Natal.

3471

11. ERYTHROPHLOEUM, Afz.

Calyx-tube short; limb campanulate, with 5 very short sub-equal teeth. *Petals* 5, slightly imbricate, small. *Stamens* 10, free, equal, or the alternate shorter, inserted with the petals on a perigynous disc; anthers uniform, without glands. *Ovary* stalked, many-ovuled; style short; stigma terminal, obtuse. *Pod* oblong, compressed, 2-valved. *Seeds* ovate, compressed, transverse; funicle filiform; testa pulpy outside.

Unarmed trees; leaves bipinnate; pinnæ few-jugate; the leaflets leathery, often alternate; flowers small, shortly pedicelled; inflorescence a raceme, with the racemes densely paniced at the apex of the branches; bracts small; bracteoles 0.

Species about 14, natives of Africa, the Seychelles Islands, tropical and eastern Asia, Queensland, and North Australia; 2 species recorded from the Transvaal, Swaziland, Zululand, and Natal.

3474

12. BURKEA, Benth.

Calyx-tube almost none; limb campanulate, equally 5-lobed. *Petals* 5, sub-equal, obovate, imbricate. *Stamens* 10, sub-equal, with very short filaments; anthers uniform, ovate, with an apical gland. *Ovary* sessile or shortly stalked, with 2 ovules; style very short, thick; stigma terminal, concave. *Pod* oblong, flattened, somewhat leathery (indehiscent?). *Seeds* sub-orbicular, flattened, with a filiform funicle.

Trees or tall shrubs, unarmed; leaves bipinnate; pinnæ few-jugate; leaflets leathery; stipules minute; flowers small; inflorescence an interrupted spike, with the spikes elongated and simple, or paniced; bracts small.

An African genus of 2 species; 1 species in the Transvaal.

3490

13. COPAIFERA, Linn.

Calyx-tube very short or 0; segments or sepals 4 or 5, imbricate or sub-valvate. *Petals* 0. *Stamens* 8-10, free; filaments glabrous; anthers uniform. *Ovary* stalked, 2-ovuled; style elongated, filiform; stigma terminal, truncate. *Pod* stalked, obliquely elliptic or falcate-ovate, compressed or turgid, leathery, 2-valved. *Seed* 1, pendulous, with the funicle dilated into a short fleshy or cup-like aril, or the seed almost involute.

Trees, unarmed; leaves paripinnate; leaflets 1 to many-jugate (unijugate in the African species), leathery, often oblique; stipules small; flowers small; inflorescence a spike or sub-raceme, with the spikes or racemes in interrupted panices; bracts small, ovate, caducous, or rarely somewhat large and persistent; bracteoles 0.

Species 25, natives of Africa and America; 1 species found in the Transvaal.

3504

14. BRACHYSTEGLIA, Benth.

Calyx usually of 5 free, often very minute, ciliate sepals, sometimes reduced to 1 sepal, or calyx 0. *Petals* 0, or represented by very small scale-like bodies. *Stamens* 10, with the filaments united at the base only or united to form a long tube. *Ovary* usually stalked, rarely sessile, hirsute (as far as known), few-ovuled. *Pod* oblong, truncate at the apex, woody, with the valves twisting on dehiscence. *Seeds* much compressed, hard, more or less orbicular.

Trees; leaves alternate, paripinnate: leaflets 2 to many-jugate; stipules deciduous, or more or less persistent, with a broad foliaceous base and a long terminal appendage; inflorescence a panicle or a spiciform raceme; bracts usually caducous.

An African genus of 54 species; several species found in Rhodesia; doubtfully recorded from South Africa.

3506

15. SCHOTIA, Jacq.

Calyx-tube turbinate, short or long-attenuated at the base; segments 4, strongly imbricate. *Petals* 5, a little unequal, sub-sessile, imbricate, sometimes reduced to minute scales. *Stamens* 10, free or very shortly connate at the base; anthers uniform. *Ovary* stalked, with the stalk adnate to the calyx-tube, many-ovuled; style elongated; stigma small, terminal. *Pod* oblong or broadly-linear, often falcate, compressed, leathery, sub-dehiscent. *Seeds* orbicular, compressed, with the funicle sometimes small, sometimes expanded into a fleshy cup-like aril.

Small trees or shrubs, unarmed; leaves paripinnate; stipules small; flowers red, large, clustered in short panicles; bracts and bracteoles ovate or oblong, membranous, caducous.

An African genus of 7 species; 5 species in South Africa, extending from the Transvaal through Natal and the eastern districts to Riversdale.

3506a

16. UMTIZA, Sim

Calyx-tube campanulate; segments 5, short, equal. *Petals* 5, free, slightly imbricate. *Stamens* 10, equal, free; anthers reniform. *Ovary* sessile, 2-ovuled; style long-exserted; stigma capitate. *Pod* compressed, pointed, firmly membranous, 1-seeded, dehiscent. *Seeds* oval, somewhat compressed.

A small, strongly armed evergreen tree; leaves paripinnate; leaflets 7-12-jugate; stipules 0; inflorescence a short panicle, mostly terminal on short lateral twigs.

Endemic; species 1, only known from East London.

3509

17. AFZELIA, Smith

Calyx-tube elongated; segments 4, a little unequal, strongly imbricate. *Petal* 1, clawed, orbicular or reniform; lateral and anterior petals minute, squamiform, or 0. *Stamens* 3-8 (5-8 fertile in the African species), free or very shortly connate at the base; anthers ovate; staminodes 2-4, small or 0 (2 in the African species?). *Ovary* stalked, with the stalk adnate to the calyx-tube, many-ovuled; style elongated; stigma truncate, sub-capitate. *Pod* obliquely-oblong, compressed, thick and leathery, or woody, 2-valved or sub-indehiscent, with transverse septa between the seeds. *Seeds* ovate or orbicular, thick, with a large cup-like aril (in the African species), or aril absent.

Unarmed trees; leaves paripinnate, or rarely sub-imparipinnate; leaflets leathery, few-jugate; stipules not seen; flowers large; inflorescence a raceme, with the racemes shortly paniced at the apex of the branches; bracts ovate, concave, deciduous or reflexed; bracteoles ovate, concave, sub-persistent, shorter than the buds.

Species about 24, natives of Africa and tropical Asia; 1 species in the Transvaal and Swaziland.

3528

18. BAUHINIA, Linn.

Calyx-tube sometimes shortly turbinate, sometimes elongate; limb spathaceous, or 5-toothed, -lobed, or -partite. *Petals* 5, a little unequal, erect or spreading, imbricate. *Stamens* 10, free or connate, all or some fertile, some reduced to staminodes; anthers ovate, oblong, or linear, versatile. *Ovary* stalked or rarely sub-sessile, with the stalk free in or adnate to the calyx-tube, 2 to many-ovuled; style elongated and filiform, or very short; stigma terminal, small, or variously dilated, often peltate or oblique. *Pod* oblong or linear, straight or oblique, rarely falcate, membranous, leathery, sub-fleshy, or hard, indehiscent or 2-valved, sometimes septate between the seeds. *Seeds* orbiculate or ovate, compressed.

Trees or shrubs, erect or scandent, with the extremities of the inflorescence occasionally cirrhose; leaves sometimes simple, entire or two-lobed, sometimes distinctly two-foliolate; stipules various, often small, caducous; inflorescence a raceme; racemes simple, terminal, or rarely axillary, or arranged in ample terminal panicles or corymbs.

Species about 290, found in all tropical regions; 9 species in South Africa, extending from the Transvaal, through Swaziland, Natal, and the eastern districts, to East London.

3529

19. CERATONIA, Linn.

Calyx-tube shortly turbinate; segments 5, short, tooth-like, imbricate, deciduous. *Petals* 0. *Stamens* 5; anthers ovate, thickish, versatile. *Disc* within the stamens, expanded horizontally, cup-shaped. *Ovary* very shortly stalked in the middle of the disc, many-ovuled; style very short; stigma peltate. *Pod* elongate, compressed, thick-leathery, indehiscent, pulpy within and septate between the seeds. *Seeds* obovate, compressed.

A small or medium-sized tree; leaves paripinnate; leaflets coriaceous, few-jugate; stipules minute or 0; flowers small, unisexual with occasional bisexual flowers; inflorescence a raceme; racemes short, lateral in the forks of the previous year's branches, solitary or fascicled; bracts and bracteoles minute, scale-like, deciduous.

Species 1, native of the Mediterranean region; naturalised in South Africa.

3530

20. DIALIUM, Linn.

Calyx-tube very short; segments 5-7, strongly imbricate, herbaceous or petaloid. *Petals* 1-5, small, sometimes 0. *Stamens* usually 2-3, sometimes 5 or 10, with short filaments and oblong anthers. *Ovary* sessile or stalked, 2-ovuled; style short, subulate; stigma terminal, small. *Pod* ovate-orbicular, somewhat compressed or ovoid-globose, indehiscent; exocarp hard or fragile; endocarp often pulpy. *Seed* 1, more or less compressed.

Unarmed trees; leaves imparipinnate; leaflets few, leathery or sub-membranous; stipules small or inconspicuous; flowers small; inflorescence an axillary or terminal paniced cyme.

Species about 12, found in all tropical regions; 1 species recorded from Zululand.

3536

21. CASSIA, Linn.

Calyx-tube very short ; segments 5, imbricate. *Petals* 5, imbricate, spreading, sub-equal or the lower larger. *Stamens* 10, all perfect and sub-equal, or 3 or 5 wanting or imperfect ; anthers uniform, or the 2 or 3 anterior larger, dehiscing by terminal pores, or longitudinally. *Ovary* sessile or stalked, frequently arcuate, several- or many-ovuled ; style short or elongated ; stigma terminal, truncate. *Pod* terete or flattened, indehiscent or 2-valved, with or without transverse septa, rarely winged or appendaged. *Seeds* flattened at right angles to, or parallel with the valves, transversely, or rarely longitudinally, disposed in the legume.

Trees, shrubs, or herbs ; leaves paripinnate, or rarely reduced to a petiolar phyllode ; common petiole frequently with sessile or stipitate glands ; stipules various ; inflorescence an axillary or terminal raceme, or corymb, or flowers in fascicles, occasionally solitary or clustered in the leaf axils, yellow or red, rarely white.

Species about 470, found in all warm parts of the world ; 9 species in South Africa, ranging from the Transvaal through Natal and the eastern districts to Riversdale, but also found in the Orange Free State, Barkly West and Bechuanaland.

3544

22. GLEDITSCHIA, Linn.

Flowers unisexual, with occasional bisexual flowers. *Calyx-tube* turbinate-campanulate ; segments 3-5, narrow, sub-equal, with open or sub-imbricate aestivation. *Petals* 3-5, a little unequal, imbricate. *Stamens* 6-10, free ; anthers uniform. *Ovary* in the male flowers rudimentary or 0 ; in the female flowers sub-sessile, 2 to many-ovuled ; style short ; stigma terminal. *Pod* ovate or elongate, straight, compressed, coriaceous or sub-fleshy, indehiscent or tardily 2-valved, often pulpy within. *Seeds* obovate or orbicular, compressed.

Armed trees ; leaves bipinnate or simply paripinnate ; inflorescence a cyme in the forks of the branches, or a simple or paniced lateral axillary raceme, or flowers fascicled, small, greenish or white.

Species about 17, found in North and South America, temperate and sub-tropical Asia, and Africa ; 1 species naturalised in South Africa.

3551

23. PARKINSONIA, Linn.

Calyx-tube short ; segments 5, a little unequal, narrowly imbricate or sub-valvate. *Petals* 5, spreading. *Stamens* 10, free ; filaments villous at the base ; anthers uniform, ovate. *Ovary* shortly stalked, many-ovuled ; style filiform ; stigma small, terminal. *Pod* linear, twisted, sub-2-valved, constricted between the seeds. *Seeds* oblong.

Trees or shrubs, usually spiny ; leaves pinnate, with the common petiole ending in a spine, multi-jugate ; leaflets small ; stipules often short, spinous ; inflorescence a short lax axillary raceme ; bracts small, caducous ; bracteoles 0.

Species 5, in the warm parts of America ; 1 species occurs in Little Namaqualand.

3552

24. HAEMATOKYLON, Linn.

Calyx-tube short ; segments 5, a little unequal, strongly imbricate. *Petals* 5, oblong, spreading, a little unequal, imbricate. *Stamens* 10, free ; filaments pilose at the base ; anthers uniform. *Ovary* shortly stalked, 2-3-ovuled ; style filiform ; stigma small, terminal. *Pod* lanceolate, flattened, membranous. *Seeds* transversely oblong.

Trees or shrubs; leaves simply paripinnate, or with the lower jugæ bipinnate; stipules in some places spinescent, in other places small and deciduous; flowers small; inflorescence a short lax axillary raceme; bracts minute or inconspicuous; bracteoles 0.

Species 4, found in Africa, central America, and east India; 2 species in South-West Africa.

3553

25. *PTEROLOBIUM*, R.Br.

Calyx-tube short; segments 5, imbricate. *Petals* 5, spreading, a little unequal, imbricate. *Stamens* 10, free, sometimes declinate, sometimes sub-equal; filaments villous at the base or almost glabrous; anthers uniform. *Ovary* sessile, 1-ovuled; style short or elongated, clavate at the apex; stigma terminal, truncate or concave. *Pod* sessile, compressed, produced at the apex into a membranous oblique oblong or falcate wing. *Seed* pendulous, compressed.

Trees or scandent shrubs, armed with recurved spines; leaves bipinnate; leaflets numerous, small; stipules small or inconspicuous; flowers small; inflorescence a raceme; racemes laxly paniced at the apex of the branches; bracts caducous; bracteoles 0.

Species 10, found in all tropical regions; 1 species recorded from the Waterberg district of the Transvaal.

3557

26. *HOFFMANNSEGGIA*, Cav.

(*Melanosticta*, DC.)

Calyx-tube very short; segments 5, oblong or lanceolate, a little unequal, slightly imbricate or valvate. *Petals* 5, oblong or ovate, spreading, imbricate. *Stamens* 10, free, slightly declinate; filaments often glandular at the base; anthers uniform. *Ovary* sub-sessile, many-ovuled; style short, or elongated and filiform, with the apex often incurved and clavate; stigma terminal, small or concave. *Pod* sub-sessile, linear or ovate, straight or often falcate, compressed, 2-valved; valves membranous or slightly leathery, often glandular or covered with short plumose setae. *Seeds* transversely or obliquely ovate.

Herbs or low undershrubs, often glandular; leaves bipinnate; leaflets small; stipules small; inflorescence a terminal raceme, or the racemes opposite the leaves; bracts deciduous; bracteoles 0.

Species 34, found in Texas, Mexico, and Africa; 3 species in South Africa, extending from the Transvaal into Natal and westwards through Bechuanaland into South-West Africa.

3559

27. *CAESALPINIA*, Linn.

(*Guilandina*, Linn.)

Calyx-tube short or very short; segments 5, imbricate. *Petals* 5, orbicular or rarely oblong, spreading, strongly imbricate. *Stamens* 10, free, declinate; filaments often villous or glandular at the base; anthers uniform. *Ovary* sessile, few-ovuled; style terete, often filiform, rarely clavate at the apex; stigma terminal, truncate, concave or minute. *Pod* ovate, oblong, lanceolate, or falcate, compressed. *Seeds* transverse, variously shaped.

Trees or shrubs, sometimes scandent, unarmed, or armed with a few spines; leaves bipinnate; leaflets sometimes small, numerous or few, sometimes large, herbaceous or coriaceous; stipules various; flowers often large; inflorescence a raceme; racemes lax in the upper axils or paniced at the apex of the branches; bracts small or rarely large and membranous, often caducous; bracteoles 0.

Species about 94, found in all warm regions 2 species in South-West Africa, others cultivated or naturalised.

3561

28. PELTOPHORUM, Vog.

Calyx-tube very short ; segments 5, imbricate, sub-equal. *Petals* 5, orbicular, spreading, a little unequal, strongly imbricate. *Stamens* 10, free, declinate ; filaments pilose at the base ; anthers uniform. *Ovary* sessile, 2 to many-ovuled ; style filiform ; stigma broadly peltate. *Pod* oblong-lanceolate, rarely elongated, compressed, indehiscent. *Seeds* 1-2 or rarely 3-4, transverse, compressed.

Tall trees, unarmed ; leaves bipinnate ; leaflets small, numerous ; stipules small, caducous ; inflorescence a raceme ; racemes paniced at the apex of the branches ; bracts narrow or lanceolate, often caducous ; bracteoles 0.

Species about 12, found in all tropical regions ; 1 species found in the Transvaal, Zululand, and Bechuanaland.

3574

29. SWARTZIA, Schreb.

Calyx-tube very short or almost 0 ; limb at first globose and entire, at length splitting variously as the flower expands. *Petals* (in the African species) 1, broad, sometimes with 2 small lateral petals, or petals 0. *Stamens* many, free or shortly connate at the base ; anthers uniform. *Ovary* stalked, often incurved, many-ovuled, narrowed into the style ; stigma terminal, small or rarely capitate. *Pod* ovoid or elongate, sometimes turgid, sometimes sub-terete, leathery or fleshy, 2-valved or indehiscent. *Seeds* reniform, ovoid, or globose, sometimes with an aril.

Unarmed trees ; leaves imparipinnate or simple (pinnate in the African species) ; leaflets leathery or herbaceous ; stipules small or rarely foliaceous ; inflorescence a raceme ; the racemes often short and fascicled, or paniced on leafless branchlets, or rarely lateral and axillary, or 1-flowered ; bracts caducous, often small ; bracteoles small, rarely persistent.

Species about 70, found in tropical America and Africa and also in Madagascar ; 1 species recorded from Rhodesia (a doubtful record from the northern Transvaal).

3602

30. SOPHORA, Linn.

Calyx shortly toothed. *Standard* broadly obovate or orbicular, erect or spreading, long ; wings oblong, oblique ; keel oblong, sub-erect, its petals usually imbricate or cohering along the back. *Stamens* free or rarely subconnate at the base ; anthers versatile. *Ovary* shortly stalked, many-ovuled ; style incurved ; stigma minute, terminal. *Pod* moniliform, terete or slightly compressed, fleshy, leathery, or woody, indehiscent or scarcely tardily 2-valved. *Seeds* obovoid or globose.

Trees, shrubs, or rarely perennial herbs ; leaves imparipinnate ; leaflets sometimes numerous and small, sometimes few and large ; inflorescence a simple terminal raceme or a leafy terminal panicle ; bracts linear, minute or 0 ; bracteoles often 0.

Species about 41, found in all warm regions ; 2 species in South Africa, recorded from the northern Transvaal and Natal.

3607

31. CALPURNIA, E.Mey.

Calyx campanulate, 5-toothed ; the 2 upper lobes smaller and partly connate. *Standard* clawed, reflexed, bilobed at the apex ; wings clawed, oblong, obtuse ; keel clawed, usually plano-convex in outline, obtuse. *Stamens* free or connate at the base ; filaments glabrous or rarely pubescent ; anthers oblong. *Ovary* stalked, several-ovuled ; style curved ; stigma small, capitate. *Pod* stalked, usually broadly linear, sometimes with a narrow wing on the ventral suture. *Seeds* compressed.

Shrubs or small trees; leaves pinnate, 3 to many-jugate; inflorescence an axillary or terminal raceme; racemes often paniced.

An African genus of 7 species; 1 species in tropical Africa, the remainder extending from the Transvaal, through Natal and the eastern districts to Riversdale.

3607a

32. *BOLUSANTHUS*, Harms

Calyx sub-equally 5-toothed beyond the middle, with the 2 upper teeth connate high up. *Petals* much exceeding the calyx; standard oblong, obtuse, clawed at the base; wings oblong, obtuse; carina as long as the wings. *Stamens* free, unequal; anthers oval, dorsifixed. *Ovary* sub-sessile, densely silky, 4-5-ovuled; style curved; stigma small, capitate. *Pod* oblong-linear, flat, compressed, attenuated at the apex. *Seeds* 3-4.

A tree; leaves imparipinnate, 3-6-jugate; the leaflets opposite or alternate flowers blue; inflorescence a lax terminal raceme; bracts and bracteoles subulate, deciduous.

Endemic; species 1, found in the northern Transvaal and Swaziland.

3608

33. *VIRGILIA*, Lam.

Calyx widely campanulate, shortly 2-lipped; the upper lip 2-toothed; the lower lip 3-toothed. *Standard* sub-orbicular, strongly reflexed; wings falcate; keel shorter than the wings, incurved, beaked. *Stamens* free; anthers versatile. *Ovary* sessile, few-ovuled; style incurved, subulate; stigma small, terminal. *Pod* linear, compressed, leathery, 2-valved. *Seeds* ovate, sub-compressed.

A tree; leaves pinnate; leaflets small; stipules narrow, caducous; inflorescence a short terminal raceme; bracts broad, caducous; bracteoles 0.

Endemic; species 1, extending from the Cape to Van Staden's River Valley.

3612

34. *BAPHIA*, Afzel.

(*Bracteolaria*, Hoehst.)

Calyx ovoid or globose, shortly toothed, splitting into 2 reflexed lobes or down one line. *Petals* sub-sessile; standard orbicular; wings obliquely oblong or obovate; keel slightly incurved, obtuse. *Stamens* free. *Ovary* sub-sessile, 2-4-ovuled; style incurved, shortly subulate; stigma small, terminal. *Pod* linear, lanceolate or falcate, acuminate, flattened, leathery, 2-valved. *Seeds* sub-orbicular.

Trees or shrubs; leaves simple; stipules small; flowers fascicled in the leaf-axils, or inflorescence an axillary and terminal raceme (paniced in the South African species); bracts small; bracteoles sometimes large but deciduous, sometimes shorter than the calyx.

Species 58, natives of Africa and Madagascar; 1 species recorded from Natal.

3620

35. *CYCLOPIA*, Vent.

Calyx sub-equally 5-lobed, indented at the base. *Standard* shortly clawed, orbicular; wings oblong, with a transverse fold; keel incurved, obtusely rostrate, with a small triangular pocket. *Stamens* free or slightly connate at the base; filaments dilated. *Ovary* sessile or shortly stalked, many-ovuled; style filiform; stigma minute, terminal. *Pod* oblong, compressed, with leathery valves.

Erect branched shrubs; leaves palmately 3-foliate; the leaflets frequently with revolute margins; stipules 0; flowers peduncled or sub-sessile, axillary, solitary; bracts 2, rarely 3.

Endemic; species 12, mainly in the south-western districts but, extend into the Uitenhage district.

3621

36. PODALYRIA, Lam.

Calyx broadly campanulate, indented at the base, toothed or with sub-equal lobes. *Standard* sub-orbicular, emarginate, a little longer than the wings, with a short recurved claw; wings obovate, oblique; keel shorter than the wings, broadly obovate. *Stamens* free or very shortly connate at the base. *Ovary* sessile, villous, many-ovuled; style filiform; stigma minute, terminal. *Pod* ovoid or oblong, turgid; valves leathery. *Seeds* with an appendage.

Silky-pubescent or villous shrubs; leaves alternate, simple; stipules subulate, often deciduous; flowers 1-2-, rarely 3-4-, nate on axillary peduncles.

Endemic; species 20, mostly in the south-western districts, but extend through the coastal belt into Natal.

3642

37. LIPARIA, Linn.

Calyx 5-lobed; the 4 upper lobes lanceolate, acute; the lower lobe large, broad, petaloid. *Standard* oval-oblong; wings oblong; keel narrow, acute. *Stamens* diadelphous; anthers sub-uniform. *Ovary* sessile, few-ovuled; style filiform; stigma small, terminal. *Pod* ovate or oblong, oblique, compressed, 2-valved. *Seeds* with an appendage.

Shrubs; leaves simple, alternate, pungent; stipules 0; flowers massed in terminal heads; bracts large, imbricate, clasping the flowers.

Endemic; species 4, found in the south-western districts and extending as far as Riversdale.

3643

38. PRIESTLEYA, DC.

Calyx sub-equally 5-cleft, or the lowest lobe a little longer. *Standard* sub-orbicular; wings obovate-falcate; keel incurved, beaked or obtuse. *Stamens* diadelphous; anthers sub-uniform. *Ovary* sessile, 2 to many-ovuled; style subulate, entire or 2-toothed at the apex; stigma small, terminal. *Pod* oblong or broadly linear, oblique, compressed, 2-valved.

Shrubs, often silky-villous; leaves simple, alternate; stipules 0; inflorescence a terminal head or raceme, or rarely flowers axillary; bracts ovate, lanceolate, or the inner setaceous; bracteoles setaceous, caducous.

Endemic; species 15, mostly south-western, but extend into the Uitenhage district.

3644

39. AMPHITHALEA, E. & Z.

Calyx narrowly toothed or the lobes sub-equal; the 2 upper broader or connate high up. *Standard* ovate or orbicular; wings oblong; keel straight, obtuse, spurred or gibbous on either side. *Stamens* diadelphous; anthers unequal; the smaller anthers versatile; the larger basifixed. *Ovary* sessile, 1-4-ovuled; style incurved; stigma terminal. *Pod* ovate or oblong, often acute, compressed, 2-valved. *Seeds* 1-4, appendaged.

Small shrubs, silky-villous or rarely glabrous, often heath-like; leaves simple, alternate, flat or with recurved margins; stipules 0; flowers purple or rosy, with the carina darkly tinted, axillary and sub-sessile, or crowded into a leafy spike; bract 1.

Endemic; species 10, mostly south-western, but extend eastwards as far as Cathcart.

3645

40. LATHRIOGYNE, E. & Z.

Calyx-lobes sub-equal, longer than the tube. *Standard* ovate; wings oblong, falcate; keel beaked, with a pocket on either side. *Stamens* monadelphous; anthers unequal; the smaller anthers versatile; the larger basifixed. *Ovary* sessile, 1-ovuled; style incurved; stigma terminal. *Pod* not seen.

A silky-villous ericoid shrub; leaves simple; inflorescence a terminal leafy head.

Endemic; species 1, recorded from the Worcester and Caledon districts of the Cape Province.

3646

41. COELIDIUM, Vog.

Calyx toothed or with sub-equal lobes. *Standard* ovate or orbicular; wings oblong; keel somewhat straight, obtuse, with a pocket on either side. *Stamens* monadelphous, with the tube sometimes short; anthers unequal; the smaller versatile; the larger basifixed. *Ovary* sessile, 1-ovuled; style incurved; stigma terminal. *Pod* ovate, somewhat acute, 2-valved. *Seeds* appendaged.

Silky-villous ericoid shrubs; leaves simple; stipules 0; flowers usually sub-sessile and clustered in the axils of the upper leaves, rarely 2-flowered on long peduncles.

Endemic; species 8, mostly south-western, but extend as far as Riversdale.

3647

42. WALPERSIA, HARV.

Calyx 5-lobed; lobes unequal, the 2 upper broader. *Petals* adnate to the staminal-tube; standard ovate; wings oblong; keel sub-incurved, somewhat acute, with a pocket on either side. *Stamens* monadelphous, with the tube sometimes short; anthers unequal; the smaller versatile; the larger basifixed. *Ovary* sessile, 2-ovuled; style filiform. *Pod* not seen.

A small villous branched shrub; leaves simple, with revolute margins; stipules 0; flowers pedicelled, axillary.

Endemic; species 1, known only from the south-western area of the Cape Province.

3653

43. BORBONIA, Linn.

Calyx-lobes equal, acute or pungent, rarely the abaxial lobe longer. *Petals* clawed, usually hairy, rarely all glabrous; standard sub-orbicular; wings obliquely oblong or obovate; keel incurved, sometimes spurred. *Stamens* monadelphous; anthers unequal; the smaller versatile; the larger basifixed. *Ovary* sessile, rarely sub-sessile, 1 to many-ovuled; style arcuate; stigma terminal, capitate. *Pod* linear or lanceolate, compressed, acute, equal at the base, very rarely obliquely-ovate at the base. *Seeds* not appendaged.

Shrubs or undershrubs, glabrous, rarely villous; leaves simple, usually pungent, often cordate, amplexicaul, or perfoliate at the base, rigid, 3 to many-nerved; inflorescence a short raceme, sub-head, or sub-umbel, axillary or terminal; bracts and bracteoles often setaceous.

Endemic; species 15, mainly south-western, but extend eastwards to Albany and northwards to Calvinia.

3654

44. RAFNIA, Thunb.

Calyx-lobes sub-equal; the lowest lobe the smallest. *Standard* sub-orbicular, glabrous; wings falcate-oblong; keel incurved, beaked or obliquely truncate, sometimes gibbous. *Stamens* monadelphous; anthers unequal; the smaller versatile; the larger basifixed. *Ovary* sessile or stalked, 2 to many-ovuled. *Pod* linear or lanceolate, obliquely-acute, compressed. *Seeds* not appendaged.

Shrubs or undershrubs, glabrous and often glaucous; leaves simple, with a single main nerve; stipules 0; inflorescence a short terminal or axillary raceme, or flowers solitary; bracteoles foliaceous, or 0.

Endemic; species 30, mostly south-western, but extend from Clanwilliam through the coastal belt into Natal.

3655

45. EUCHLORA, E. & Z.

Calyx deeply 5-cleft; the lowest segment much narrower than the rest. *Standard* sub-orbicular, long-clawed; wings obliquely ovate; keel incurved, obtuse, shorter than the wings. *Stamens* monadelphous; staminal-tube slit above; anthers unequal; 5 ovate and versatile; 5 longer and basifixed. *Ovary* sessile, many-ovuled; style incurved; stigma terminal, oblique. *Pod* ovoid, turgid, 2-valved. *Seeds* without an appendage.

A prostrate plant, villous; leaves simple; stipules 0; flowers small inflorescence a dense terminal sub-capitate raceme.

Endemic; species 1, recorded from the Malmesbury and Cape districts.

3656

46. PHAENHOFFMANNIA, O.Kuntze

(*Pleiospora*, Harv.)

Calyx sub-inflated; lobes sub-equal; the 4 upper approximated in pairs; the lowest lobe the narrowest. *Standard* ovate; wings obliquely ovate; keel oblong, straight, obtuse. *Stamens* monadelphous; staminal-tube slit above; anthers sub-equal; the alternate a little smaller and on longer filaments. *Ovary* sessile, many-ovuled; style sub-erect, straight in line with the ovary; stigma terminal. *Pod* ovate-lanceolate, compressed, 2-valved. *Seeds* without an appendage.

Densely leafy shrublets, silky with tawny hairs; leaves digitately 3-foliate; stipules free; inflorescence a capitate-spike, terminal or axillary; bracts and bracteoles subulate.

Endemic; species 9, all natives of the Transvaal.

3657

47. LOTONONIS, E. & Z.

Calyx sub-equally 5-fid; the lowest segment narrower than the rest and unconnected with them; the four upper approaching in pairs and more or less connate into two bifid lobes, rarely quite separate and then all the segments sub-equal. *Standard* obcordate or oblong, commonly pubescent; wings obliquely-ovate or oblong; keel curved, not rostrate. *Stamens* monadelphous; staminal-tube slit above; anthers unequal; the smaller versatile; the larger basifixed. *Ovary* sessile or sub-sessile, many-ovuled; style curved not abruptly bent (at least not in young flowers); stigma terminal, often oblique. *Pod* oblong, lanceolate, or linear, compressed or rarely turgid, 2-valved. *Seeds* without an appendage; funicle filiform.

Rigid shrublets, diffuse or decumbent undershrubs or herbs; leaves 3-5-foliate, very rarely solitary; stipules minute or foliaceous, solitary, or in pairs, or absent; flowers solitary, in pairs, or few together, or inflorescence a terminal peduncled or sessile raceme or umbel, sometimes opposite the leaves.

An African genus of 108 species of which about 100 species are confined to South Africa, and widely distributed.

3657a

48. PEARSONIA, Dümmer

Calyx sub-equally 5-fid; the lowest segment narrower than the rest and unconnected with them; the four upper approaching in pairs and more or less connate into 2 bifid lobes; rarely quite separate and then all the segments sub-equal. *Standard* shortly clawed, straight, oblong or oblong-spathulate; wings obliquely-obovate or oblong; keel straight, long-clawed, equalling or shorter than the vexillum. *Stamens* monadelphous; anthers unequal; the shorter basifixed; the longer dorsifixed. *Ovary* sessile, 10-30-ovuled; style straight (in flowering stage); stigma terminal. *Pod* much exceeding the calyx, oblong-lanceolate, straight, somewhat compressed, 2-valved. *Seeds* without an appendage; funicle short.

Herbs, woody at the base; leaves 3-foliolate; stipules 0; inflorescence a congested or lax terminal raceme; bracts and bracteoles present.

Endemic; species 11, found in the Transvaal and Natal.

3658

49. LISTIA, E.Mey.

Calyx with the 4 upper lobes connate in pairs; the lowest free, and narrower than the others. *Standard* ovate; wings falcate-oblong; keel incurved, obtuse, longer than the standard. *Stamens* monadelphous; staminal-tube split above; anthers unequal; the smaller versatile; the larger basifixed. *Ovary* sessile, many-ovuled; style incurved, glabrous; stigma terminal, oblique. *Pod* linear, compressed, repeatedly folded and twisted from side to side. *Seeds* without an appendage; funicle filiform.

A prostrate herb; leaves digitately 3-foliolate; inflorescence a terminal raceme; bracts small; bracteoles 0.

Endemic; species 1, ranging from the Transvaal through the north-western districts to S.W. Africa; also found in Basutoland, in the north-eastern districts, the Orange Free State, and recorded from Komgha.

3660

50. LEBECKIA, Thunb.

Calyx obliquely-campanulate, toothed, more rarely 5-cleft. *Standard* sub-orbicular or ovate; wings oblong or obovate; keel obtuse, acute, or sub-rostrate, equalling, or shorter, or longer than the standard. *Stamens* monadelphous; staminal-tube split above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sessile or stalked, many-ovuled; style incurved; stigma terminal. *Pod* linear, compressed or terete. *Seeds* without an appendage; funicle very short.

Shrubs or undershrubs, sometimes with unarmed virgate branches, sometimes the branches spinescent, glabrous or silky; leaves 3-foliolate, sometimes 1-foliolate, rarely filiform; stipules present or 0; inflorescence a terminal often unilateral raceme.

Endemic; species 25, extending from Natal through the coastal belt to the Cape, but also found in the central region.

3661

51. WIBORGIA, Thunb.

(*Viborgia*, Thunb.)

Calyx obliquely and sub-equally toothed. *Petals* with long slender claws. *Standard* ovate or orbicular; wings often shorter than the standard; keel incurved, obtuse or rostrate, longer than the standard. *Stamens* monadelphous; staminal-tube split above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* stalked, few-ovuled; style incurved; stigma terminal. *Pod* stalked, ovate or rarely oblong, flat, indehiscent, winged on the upper suture, sharp and thin along the lower. *Seeds* without an appendage; funicle filiform.

Rigid shrubs, sometimes spinescent; leaves digitately 3-foliolate; stipules small or 0; inflorescence a terminal often unilateral raceme; bracts and bracteoles small or inconspicuous.

Endemic; species 7, extending from the south-eastern districts to Riversdale, but also found in South-West Africa.

3662

52. ASPALATHUS, Linn.

Calyx toothed, with the lobes sub-equal, or the 2 upper shorter and broader, or the lowermost longest. *Standard* oblong, ovate or orbicular, with the

claw often short; wings oblong or falcate; keel obtuse, incurved or sub-rostrate, shorter than the vexillum. *Stamens* monadelphous; staminal-tube split above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sessile or shortly stalked, 2 to many-ovuled; style incurved; stigma terminal. *Pod* semi-ovate or semi-lanceolate, oblique, acute, compressed or turgid, 1 to many-seeded. *Seed* without an appendage; funicle filiform.

Shrubs or undershrubs, ericoid, spinescent or fleshy; leaves simple, ternate or fascicled, usually ericoid or, rarely flat; stipules 0; inflorescence a terminal spike or head, or flowers solitary in the leaf-fascicles; bracts and bracteoles often foliaceous.

Endemic; species 155, massed in the south-western districts, but extend into Natal; generally widely distributed.

3663

53. BUCHENROEDERA, E. & Z.

Calyx sub-equally 5-lobed or 5-fid. *Standard* with a long claw, orbicular or ovate; wings oblong; keel obtuse, shorter than the standard. *Stamens* monadelphous; staminal-tube slit above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sessile, many-ovuled; style incurved; stigma terminal. *Pod* ovate, obliquely-acute, turgid, slightly exceeding the calyx. *Seeds* 1-3, without an appendage; funicle filiform.

Silky-pubescent or villous shrubs; leaves petioled, digitately 3-foliate; stipules foliaceous; inflorescence a terminal spike or head; bracts foliaceous; bracteoles 0.

Endemic; species 10, extending from Natal to the Uitenhage district.

3664

54. DICHILUS, DC.

Calyx 2-lipped; the upper lip 2-toothed; the lower lip 3-toothed. *Standard* sub-orbicular or ovate; wings obliquely-oblong; keel obtuse, longer than the wings and standard. *Stamens* monadelphous; staminal-tube split above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sub-sessile, many-ovuled; style incurved; stigma terminal. *Pod* linear, compressed, sub-torulose, 2-valved. *Seeds* without an appendage; funicle short.

Slender undershrubs; leaves digitately 3-foliate; stipules inconspicuous; flowers drooping, solitary at the apex of the branches or 2-3 together; bracteoles minute.

Endemic; species 4, found in the Transvaal, Natal, the eastern Orange Free State, and Basutoland; also recorded from Middelburg and Beaufort West.

3665

55. MELOLOBIUM, E. & Z.

Calyx shortly or deeply 2-lipped; the upper lip bipartite; the lower lip trifid or 3-toothed. *Petals* not much longer than the calyx; standard ovate, oblong or sub-orbicular; keel obtuse, shorter than the wings and the standard. *Stamens* monadelphous; staminal-tube split above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sessile, many-ovuled; style incurved; stigma terminal. *Pod* linear, compressed, often torulose, glandular or villous, 2-valved, constricted between the seeds. *Seeds* without an appendage; funicle short.

Shrubs or undershrubs, often spinescent, glandular-villous or viscid; leaves petioled, digitately 3-foliate; stipules often foliaceous; flowers small; inflorescence a short terminal spike or raceme; bracts and two bracteoles often foliaceous.

Endemic; species 12, widely distributed over the Union.

3669

56. CROTALARIA, Linn.

Calyx-tube very often obliquely campanulate; lobes free, sub-equal, longer or shorter than the tube, or rarely the 2 upper and the 3 lower more or less connate, or the 4 upper connate in pairs and the lowest lobe narrowest, very rarely the upper calyx lobes large and foliaceous. *Corolla* often longer than the calyx, very rarely shorter; standard orbicular or ovate; wings often shorter than the keel; keel incurved or dorsally angled, rostrate. *Stamens* monadelphous; staminal-tube slit above; anthers unequal, basifixed. *Ovary* sessile or stalked, 2 to many-ovuled; style strongly incurved above the ovary or often abruptly inflexed. *Pod* sessile or stalked, globose, oblong, or cylindric, turgid or inflated, 2-valved. *Seeds* without an appendage; funicle filiform.

Herbs, undershrubs, or shrubs, unarmed or rarely spinescent; leaves simple or digitately 3-5-foliolate; stipules various, free from the petiole, large or small; flowers large to small; inflorescence a raceme, sometimes a head; racemes terminal or opposite the leaves, rarely flowers solitary; bracts small, rarely foliaceous; bracteoles often small, rarely 0.

Species over 300, found in all warm parts of the world; 309 species found in Africa alone, of which 56 species are recorded from South Africa; widely distributed.

3673

57. ARGYROLOBIUM, E. & Z.

Calyx deeply cleft; the 2 upper lobes free or connate; the 3 lower lobes connate into a 3-toothed or 3-fid lip. *Standard* sub-orbicular; wings obovate; keel slightly incurved, obtuse, shorter than the standard. *Stamens* monadelphous; staminal-tube closed or slit above; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sessile, many-ovuled; style incurved; stigma terminal, often oblique. *Pod* linear, compressed, silky or villous, 2-valved. *Seeds* without an appendage.

Herbs, undershrubs, or rarely small shrubs; leaves digitately 3-foliolate; stipules free; flowers solitary, or inflorescence a raceme or sub-umbel, terminal or opposite the leaves; bracts and bracteoles often small.

Species about 75, found in Africa, south Europe, western Asia, and east India; 52 species in South Africa, essentially eastern, extending from the Transvaal and Natal, through the coastal belt to the Cape; also found in Queens-town, Basutoland, and the eastern Orange Free State.

3682

58. CYTISUS, Linn.

Calyx toothed or shortly lobed; the 2 upper lobes connate to form a lip, or free. *Standard* sub-orbicular or ovate; wings obovate or oblong; keel straight or incurved, obtuse or scarcely acuminate. *Stamens* monadelphous; staminal-tube closed; anthers unequal; the shorter versatile; the longer basifixed. *Ovary* sessile or rarely stalked, many-ovuled; style incurved; stigma terminal, capitate or oblique. *Pod* plano-compressed, oblong or linear, 2-valved. *Seeds* with an appendage.

Shrubs, rarely spinescent; leaves sometimes 3-foliolate, sometimes 1-foliolate, or none; stipules minutely setaceous or inconspicuous; inflorescence a long terminal raceme, or flowers in short terminal fascicles, or on aborted lateral branchlets, or sub-axillary; bracts and bracteoles small, caducous, or rarely foliaceous and long persistent.

Species 50; natives of Europe, western Asia, north Africa, and the Canary Islands; some species found cultivated in South Africa.

3683

59. HYPOCALYPTUS, Thunb.

Calyx sub-equally and shortly toothed, indented at the base. *Standard* sub-orbicular; keel incurved, obtuse, shorter than the standard. *Stamens* monadelphous; staminal-tube closed; anthers unequal; the smaller versatile; the longer sub-basifixed. *Ovary* sub-sessile, many-ovuled; style incurved; stigma terminal. *Pod* linear, flat, 2-valved, with the upper suture thickened.

A shrub; leaves digitately 3-foliolate; stipules free; inflorescence a terminal raceme; the racemes often paniced; bracts and bracteoles setaceous.

Endemic; species 1, extending from Clanwilliam to Riversdale.

3684

60. LODDIGESIA, Sims

Calyx sub-equally and shortly toothed, indented at the base. *Standard* sub-orbicular; keel incurved, obtuse, longer than the standard. *Stamens* monadelphous; staminal-tube closed; anthers unequal; the shorter versatile; the longer sub-basifixed. *Ovary* sub-sessile, many-ovuled; style incurved; stigma terminal. *Pod* oblong-lanceolate, flat, 2-valved, with the upper suture thickened. *Seeds* appendaged; funicle short.

A small glabrous undershrub; leaves digitately 3-foliolate; stipules free; inflorescence a terminal raceme.

Endemic; species 1, ranging from Caledon to Knysna.

3687

61. TRIGONELLA, Linn.

Calyx 5-toothed. *Petals* free from the staminal-tube; standard obovate or oblong, sessile or clawed; wings oblong; keel obtuse, shorter than the wings. *Stamens* diadelphous; the vexillary stamen free or connate with the others to the middle; filaments not widened; anthers uniform. *Ovary* sessile or shortly stalked, many-ovuled; style filiform; stigma terminal. *Pod* various, linear or oblong-linear, compressed or terete, acuminate, many-seeded. *Seeds* without an appendage.

Herbs, often strongly scented; leaves pinnately 3-foliolate; stipules adnate to the petiole; inflorescence a head, sub-umbel, or a short and dense raceme, or flowers solitary, sessile or peduncled in the leaf-axils; bracts minute or inconspicuous; bracteoles 0.

Species about 70, natives of Europe, Asia, Africa, and Australia; 1 species in South Africa, found in the Barkly West, Cape, Beaufort West and Albany districts.

3688

62. MEDICAGO, Linn.

Calyx sub-equally 5-toothed. *Petals* free from the staminal-tube; standard obovate or oblong; wings oblong; keel obtuse, shorter than the wings. *Stamens* diadelphous, with the vexillary stamen free; filaments not widened; anthers uniform. *Ovary* sessile or sub-sessile, many- or rarely 1-ovuled; style subulate; stigma sub-capitate, oblique. *Pod* spirally falcate, often hooked, or somewhat curved and unarmed, or spinose. *Seeds* without an appendage.

Herbs, rarely shrubs; leaves pinnately 3-foliolate; stipules adnate to the petiole; flowers often small; inflorescence an axillary raceme, or head, or flowers sub-solitary; bracts small or 0; bracteoles 0.

Species about 50, natives of Europe, Asia, and Africa; many species naturalised in tropical countries; 4 species in South Africa, widely distributed.

3689

63. MELILOTUS, Juss.

Calyx sub-equally 5-toothed. *Petals* free from the staminal-tube, deciduous ; standard obovate or oblong ; wings oblong ; keel obtuse, shorter than the wings. *Stamens* diadelphous, with the vexillary stamen free or partly connate ; filaments not expanded ; anthers uniform. *Ovary* sessile or sub-sessile, few-ovuled ; style filiform, often incurved ; stigma terminal. *Pod* sub-globose or ovoid, longer than the calyx, straight, thick, indehiscent or tardily 2-valved. *Seeds* solitary or few, without an appendage.

Annual or biennial herbs ; leaves pinnately 3-foliate ; stipules adnate to the petiole ; flowers small ; inflorescence a slender or abbreviated axillary raceme ; bracts minute or 0 ; bracteoles 0.

Species about 20, natives of Asia, Europe, and north Africa ; 1 species naturalised in South Africa, and several known in cultivation.

3690

64. TRIFOLIUM, Linn.

Calyx sub-equally toothed or lobed, or the lower lobes longer ; the 2 upper sometimes more or less connate. *Petals* persistent, all or the 4 lower more or less adnate to the staminal-tube. *Standard* oblong or ovate ; wings narrow ; keel obtuse, shorter than the wings. *Stamens* diadelphous ; the vexillary stamen free or rarely partly connate ; filaments all, or the alternate, sometimes much widened ; anthers uniform. *Ovary* sessile or sub-sessile, few-ovuled ; style incurved above ; stigma capitate. *Pod* oblong or ovate, compressed or sub-terete, indehiscent, enclosed in the calyx. *Seeds* 1-2 or rarely 2-4, without appendages.

Herbs ; leaves digitately 3- (rarely 5-7-) foliate ; stipules adnate to the petiole ; inflorescence a spike, head, or umbel, or rarely flowers solitary ; bracts small or absent, or membranous and persistent or deciduous.

Species about 450, found in all temperate and sub-tropical countries ; 7 species recorded from South Africa (probably not all native), but many more are found in cultivation ; widely distributed.

3698

65. LOTUS, Linn.

Calyx sub-equally 5-toothed or cleft, or the lower lobes longer, rarely more or less 2-lipped. *Petals* free from the staminal-tube ; standard obovate, sub-orbicular or ovate-acuminate, clawed ; wings obovate ; keel incurved or inflexed, beaked, gibbous on both sides. *Stamens* diadelphous ; the vexillary stamen free ; the alternate filaments expanded at the apex ; anthers uniform. *Ovary* sessile, many-ovuled ; style inflexed above the ovary ; stigma terminal or lateral. *Pod* oblong or often linear, straight or curved, terete, turgid or rarely plano-compressed, 2-valved, septate within, rarely without septa. *Seeds* sub-globose or lenticular, without an appendage.

Herbs or undershrubs ; leaflets 3, with 1-2 leaflets next to the stem and resembling foliaceous stipules ; stipules minutely tuberculate or 0 ; inflorescence an umbel on axillary peduncles, or rarely flowers solitary ; bracts 3-foliate.

Described species about 155, but probably not all valid, natives of Europe, Asia, Africa, America, and Australia ; 5 species in South Africa, extending from the Transvaal and Natal to Komgha.

3700

66. CYAMOPSIS, DC.

Calyx obliquely toothed, with the lower teeth longer. *Standard* obovate, sessile ; wings oblong ; keel erect, sub-incurved, obtuse. *Stamens* monadelphous ; staminal-tube closed ; anthers uniform, with the connectives apiculate. *Ovary* sessile, many-ovuled ; style incurved at the apex ; stigma

capitate. *Pod* linear in outline, sub-4-angled, acuminate, 2-valved, septate within. *Seeds* without an appendage, quadrate, compressed.

Erect hairy herbs; leaves imparipinnate, 3 to many-foliate (3-foliate in the South African species); stipules small, setaceous; flowers small; inflorescence an axillary raceme; bracteoles 0.

Species 3, natives of India, Arabia, and Africa; 1 species found in the Barkly West district.

3702

67. INDIGOFERA, Linn.

Calyx small, sub-equally toothed or lobed, or the lowest lobe the longest. *Standard* ovate or orbicular, sessile or clawed; wings oblong, slightly adnate to the keel; keel straight, obtuse or acuminate, gibbous or spurred on either side. *Stamens* diadelphous; the vexillary stamen free; anthers uniform, with a glandular apiculus. *Ovary* sessile or sub-sessile, 1-2- or often many-ovuled; style glabrous; stigma capitate, often penicillate. *Pod* usually oblong or linear in outline, sometimes globose, straight, curved, or rarely coiled, septate within.

Herbs, shrubs, or undershrubs, usually hairy; leaves simple, digitately 3-5-9-foliate or imparipinnate, rarely 0; stipules often small, setaceous, shortly adnate to the petiole; inflorescence an axillary spike or raceme; bracts caducous; bracteoles 0.

Species over 450, found in all tropical and sub-tropical countries, especially abundant in Africa; 179 (probably more) species in South Africa, widely distributed.

3703

68. PSORALEA, Linn.

Calyx gland-dotted, sub-equally lobed, or the lowest segment the largest; the 2 upper segments often connate. *Standard* ovate or orbicular, clawed, with inflexed sides; wings oblong, sub-falcate; keel incurved, obtuse, shorter than the standard. *Stamens* diadelphous; the vexillary stamen free or more or less connate with the others; anthers uniform or the alternate fixed higher. *Ovary* sessile or shortly stalked, 1-ovuled, in 1 species 2-ovuled; style filiform or dilated at the base, incurved above; stigma terminal. *Pod* ovate, indehiscent, concealed in the calyx. *Seed* without an appendage; funicle very short.

Herbs, shrubs, or undershrubs; leaves gland-dotted, digitately 3 to many-foliate, pinnate or 1-foliate; stipules embracing the branches, scarcely adnate to the petiole; inflorescence a head, spike, or raceme, axillary or terminal, or flowers fascicled or rarely solitary; bracts 2-3; bracteoles 0.

Species about 124, natives of South Africa, Australia, North and South America, and other temperate and tropical countries; 46 species in South Africa, ranging from the Transvaal and Natal through the coastal belt to Clanwilliam; also through Bechuanaland into the north-western districts and the Orange Free State.

3717

69. SYLITRA, E.Mey.

Calyx lobes sub-equal; the 2 upper approximate. *Standard* obovate, clawed; wings falcate-oblong, adnate to the keel; keel obtuse, shorter than the wings. *Stamens* monadelphous; the vexillary stamen free at the base; anthers uniform. *Ovary* sessile, many-ovuled; style inflexed, filiform; stigma terminal, capitate. *Pod* oblong, compressed, membranous. *Seeds* sub-orbicular, without an appendage; funicle short, filiform.

A slender undershrub, finely canescent; leaves 1-foliate; stipules small; flowers small, axillary, usually in pairs; bracts and bracteoles minute or 0.

An African genus of 2 species; 1 species found in the north-western districts.

3718

70. TEPHROSIA, Pers.

(Requienia, DC.)

Calyx sub-equally toothed or lobed, or the 2 upper lobes connate, or the lowest longer than the rest. *Petals* clawed; standard sub-orbicular, silky or villous without; wings obliquely obovate or oblong, slightly cohering to the keel; keel incurved, obtuse or somewhat acute. *Stamens* monadelphous or diadelphous; anthers uniform. *Ovary* sessile, many-ovuled or rarely 2-ovuled; style incurved or inflexed, glabrous or variously bearded; stigma terminal. *Pod* linear or rarely ovate, compressed, 2-valved, sometimes septate within. *Seeds* sometimes with an appendage.

Herbs or undershrubs, rarely shrubs; leaves imparipinnate; leaflets many, rarely 1-3; stipules setaceous, or broad and striate; inflorescence a raceme, terminal, opposite the leaves, or axillary; bracts subulate, or ovate and spathaceous; bracteoles 0.

Species about 200, found in all warm regions, especially in Africa and Australia; about 32 species in South Africa, extending from the Transvaal through Natal and the eastern districts to Riversdale, but also extend into the Orange Free State and westward to the north-western districts and Bechuanaland.

3719

71. MUNDULEA, DC.

Calyx shortly toothed, with the 2 upper teeth sub-connate. *Standard* large, spreading, with a callus at the base, silky-pubescent; wings falcate-oblong, slightly adhering to the keel; keel incurved, obtuse. *Vexillary stamen* free at the base and then connate with the others in a closed tube; alternate filaments slightly dilated; anthers uniform. *Ovary* many-ovuled; style incurved; stigma capitate. *Pod* linear, flattened, with thickened sutures. *Seeds* reniform, without an appendage.

Shrubs or small trees, silky-pubescent; leaves imparipinnate; stipules small; inflorescence a terminal raceme; bracts small; bracteoles 0.

Species 15, found in Madagascar, East India, Ceylon, and Africa; 1 species in South Africa, found in the Transvaal, Natal, and Bechuanaland.

3720

72. MILLETTIA, Wight & Arn.

Calyx truncate or shortly toothed; the 2 upper teeth sometimes sub-connate. *Standard* large, spreading or reflexed, sometimes with a callus or eared at the base, silky-pubescent or glabrous; wings falcate-oblong, free from the keel; keel incurved, obtuse. *Vexillary stamen* free at the base, more or less connate with the others from the middle, or often all free (in the S. African species imperfectly monadelphous); filaments not dilated; anthers uniform. *Ovary* sessile or rarely stalked, many-ovuled; style inflexed; stigma small, terminal. *Pod* linear, lanceolate or oblong, compressed, rigidly coriaceous or woody, 2-valved, but often tardily dehiscent. *Seed* orbicular or reniform, without an appendage.

Trees or shrubs, sometimes scandent; leaves imparipinnate; stipules small; inflorescence a raceme or panicle at the apices of the branches.

Species about 165, found in all tropical and sub-tropical regions; 2 species in South Africa, extending from Zululand through Natal and the eastern districts to Komgha.

3732

73. BOLUSIA, Benth.

Calyx sub-equally deeply 5-fid, with the 2 upper and lateral segments approximate. *Standard* broad, emarginate; wings falcate-obovate, free; keel long, linear, spirally contorted with the filaments and style. *Stamens* diadelphous; anthers unequal; the smaller basifixed; the larger dorsifixed.

Ovary sessile, many-ovuled; style glabrous; stigma terminal, capitate. *Pod* oblong, turgid, many-seeded.

Perennial herbs or undershrubs, silky-pubescent; leaves solitary, rarely 3-foliate; stipules ovate, acuminate; flowers solitary or 2-nate on peduncles opposite the leaves; bracts and bracteoles present.

An African genus of 3 species; 1 species found in the Kuruman district.

3746

74. MICROCHARIS, Benth.

Calyx sub-equally lobed. *Standard* sub-orbicular, spreading, with a narrow claw; wings obliquely obovate-oblong, scarcely adhering to the keel; keel obtuse, shorter than the wings. *Vexillary* stamen connate with the others from the base, free from the middle; anthers uniform. *Ovary* sessile, many-ovuled, attenuated into a short style; stigma capitate. *Pod* linear, compressed, membranous, 2-valved, somewhat septate within. *Seeds* transversely oblong or quadrate, without an appendage; funicle very short.

Slender hispid herbs; leaves simple; stipules herbaceous or subulate, persistent; flowers small; inflorescence an axillary raceme; bracts narrow; bracteoles 0.

An African genus of 5 species; 1 species found at Barberton in the Transvaal.

3747

75. SESBANIA, Pers.

Calyx truncate or sub-equally toothed or lobed. *Standard* orbicular or ovate, spreading or reflexed, with 2 free or adnate appendages on the claw, very rarely appendages absent; wings falcate-oblong; keel incurved, obtuse or obtusely acuminate, long-clawed. *Stamens* diadelphous; anthers uniform, or the alternate a little longer. *Ovary* often stalked, many-ovuled; style incurved; stigma small, capitate. *Pod* linear or rarely oblong, compressed, sub-terete, 4-angled, or 4-winged, 2-valved or sub-indehiscent, septate within. *Seeds* transversely oblong or sub-quadrate, without an appendage.

Herbs or shrubs; leaves paripinnate; stipules foliaceous or subulate, often caducous; inflorescence a raceme or panicle, rarely flowers solitary or in pairs; bracts and bracteoles setaceous, caducous or rarely persistent.

Species about 50, found in all warm parts of the world, mainly in tropical Africa; 6 species in South Africa, found in the Transvaal and Natal; also recorded from the Herbert district, Bechuanaland, and S. W. Africa.

3754

76. SUTHERLANDIA, R.Br.

Calyx sub-equally toothed. *Standard* erect, shortly clawed, with the margins folded back; wings small, oblong; keel erect, incurved, somewhat acute, exceeding the standard. *Stamens* diadelphous; anthers uniform. *Ovary* stalked, many-ovuled; style filiform, incurved, bearded above; stigma minute, terminal. *Pod* ovoid, membranous, strongly inflated, sub-dehiscent. *Seeds* reniform, without an appendage; funicle filiform.

A caescent shrub; leaves imparipinnate; stipules small, narrow; flowers large, red; inflorescence a few-flowered short axillary raceme; bracts small; bracteoles minute.

Endemic; species 1, widely distributed.

3756

77. LESSERTIA, DC.

Calyx sub-equally toothed or lobed. *Standard* sub-orbicular, spreading or reflexed, with a short claw; wings oblong; keel straight or incurved, obtuse, often shorter than the standard. *Stamens* diadelphous; anthers

uniform. *Ovary* sessile or stalked, many-ovuled ; style incurved, subulate, bearded in front below the apex. *Pod* ovate, oblong, or broadly linear, membranous, inflated or compressed, at length opening at the apex. *Seeds* reniform, without an appendage ; funicle filiform.

Cano-pubescent herbs or shrubs, rarely glabrous ; leaves imparipinnate ; stipules small ; inflorescence a peduncled axillary raceme ; bracts small ; bracteoles minute or 0.

An African genus of about 44 species ; 41 species in South Africa, widely distributed.

3766

78. ASTRAGALUS, Linn.

Calyx tubular, sub-equally toothed. *Petals* often long clawed ; standard erect, ovate, oblong, or panduriform ; wings oblong ; keel equalling or a little shorter than the wings, obtuse. *Stamens* diadelphous ; anthers uniform. *Ovary* sessile or stalked, many-ovuled ; style filiform, straight or incurved, not bearded ; stigma small, terminal. *Pod* sessile or stalked (stalked in the S.A. species), 2-valved, incompletely or completely divided longitudinally into 2 loculi by the introflexion of the carinal suture. *Seeds* often reniform, without an appendage ; funicle filiform.

Herbs, undershrubs, or shrubs, unarmed or the petioles hardened and spinescent ; leaves imparipinnate, rarely digitately 3-foliolate or 1-foliolate (pinnate in the S. African species) ; stipules free (in the S.A. species) or adnate to the petiole ; inflorescence a raceme, spike, or very rarely an umbel, or flowers solitary ; peduncles axillary or from the stem (a lax axillary raceme in the S. African species) ; bracts often small, membranous ; bracteoles very small or 0, rarely large and conspicuous.

Described species about 1,500, but probably only about half of specific rank, chiefly natives of the northern hemisphere, very abundant in temperate Asia ; also found in tropical Africa ; 1 species in the Transvaal and Natal.

3769

79. GLYCYRRHIZA, Linn.

Calyx-lobes sub-equal or the 2 upper shorter or connate at the base. *Standard* ovate or oblong, erect, shortly contracted at the base ; wings obliquely-oblong, somewhat acute, free ; keel shorter than the wings, sub-acute or obtuse, with the petals scarcely connate. *Stamens* monadelphous or diadelphous ; anther-thecae confluent at the apex ; the alternate anthers smaller and opening deeply by 2 unequal valves. *Ovary* sessile, 2 to many-ovuled ; style filiform or thickish, incurved at the apex ; stigma terminal. *Pod* ovate, oblong, or shortly linear, straight or curved, turgid or compressed, glandular-muricate or rarely smooth, indehiscent or tardily 2-valved. *Seed* reniform or sub-globose, without an appendage.

Perennial herbs, often glandular, with the root often sweet ; leaves imparipinnate ; leaflets many, rarely 3 ; stipules narrow, membranous, caducous ; inflorescence a peduncled or sessile raceme or spike ; bracts narrow, very caducous ; bracteoles 0.

Species 12, mostly natives of the Mediterranean Region and temperate and sub-tropical Asia ; a single species found in South America and Australia ; 1 species found in parts of South Africa as a weed in cultivated land.

3778

80. HEDYSARUM, Linn.

Calyx sub-equally toothed or lobed. *Standard* obovate or obcordate, narrowed, but scarcely clawed at the base ; wings oblong, shorter than the standard, sometimes very short ; keel often exceeding the wings, obliquely-truncate at the apex or rarely obtuse and sub-curved. *Stamens* diadelphous ; anthers uniform. *Ovary* sub-sessile, many- (often 4-5-) ovuled ; style

filiform, abruptly inflexed above together with the stamens; stigma small, terminal. *Pod* compressed, of 1-3 flattened indehiscent joints, smooth or muricate. *Seeds* compressed, reniform, without an appendage.

Perennial herbs, undershrubs, or rarely shrubs, glabrous, woolly, or silky-villous; leaves imparipinnate; stipules scarious; inflorescence a peduncled axillary raceme; bracts scarious or setaceous; bracteoles setaceous under the calyx.

Species about 100, natives of temperate Europe, north Africa, Asia, and North America; found frequently in cultivation in South Africa.

3783

81. ALHAGI, Desv.

Calyx with short sub-equal teeth. *Standard* obovate, with a short claw; wings falcate-oblong, free; keel incurved, obtuse, sub-equalling the wings and standard. *Stamens* diadelphous; anthers uniform. *Ovary* sub-sessile, many-ovuled; style filiform, incurved; stigma small, terminal. *Pod* linear, sub-continuous or moniliform, with the joints oblong turgid and smooth. *Seeds* reniform, without an appendage.

A rigid shrub, with axillary spines; leaves simple, often small; stipules small; inflorescence a 2-6-flowered axillary raceme, or flowers solitary; rhachis of raceme ending in a spine; bracts very small; bracteoles 0.

Species 3, natives of Greece, the Orient, western Asia, and north Africa: one species found in parts of the Little Karroo.

3792

82. ORMOCARPUM, Beauv.

Calyx with the 2 upper lobes connivent or shortly connate; the lowest rather longer than the rest. *Standard* orbicular, clawed; wings obliquely-ovate; keel broad, incurved, sub-acute or obtuse, sub-equalling the wings. *Stamens* monadelphous; the staminal-tube often splitting on both sides so that the stamens appear in 2 bundles of 5 each; anthers uniform. *Ovary* sessile, many-ovuled; style strongly inflexed, filiform; stigma terminal. *Pod* linear, compressed, dividing into 2 or more oblong or elongated indehiscent portions, narrowed at each end, rugose, often glandular-muricate (in the S. African species), often only 1 perfect. *Seeds* narrowly oblong.

Tall shrubs, often glutinous; leaves imparipinnate with many leaflets (in the S. African species), or 1-foliolate; stipules striate; flowers solitary, or inflorescence a few-flowered axillary raceme.

Species about 11, found in tropical regions; 1 species recorded from the Transvaal.

3793

83. AESCHYNOMENE, Linn.

Calyx-lobes sometimes sub-equal, sometimes 2-lipped; the upper lip entire or 2-fid; the lower lip entire or 3-fid. *Standard* orbicular, shortly clawed; wings obliquely ovate or oblong, sub-equalling the standard; keel sometimes obovate and slightly incurved, sometimes often narrow and strongly incurved or sub-rostrate. *Stamens* monadelphous; the staminal-tube sometimes split on two sides so that the stamens appear in 2 bundles of 5 each, very rarely diadelphous; anthers uniform. *Ovary* stalked, 2 to many-ovuled; style incurved, beardless; stigma terminal. *Pod* stalked, exceeding the calyx, divided into 2 to many flat or convex segments; the segments smooth or muricate, mostly indehiscent.

Herbs, shrubs, or undershrubs; leaves sub-imparipinnate; leaflets many; stipules setaceous or lanceolate; inflorescence an axillary, or rarely terminal, raceme, or flowers solitary.

A genus of about 112 species, found in tropical regions especially in Africa and South America; 6 species recorded from the Transvaal, Natal, and Zululand.

3796

84. SMITHIA, Ait.

Calyx deeply lobed, 2-lipped; the upper lip entire or emarginate; the lower lip entire, 3-toothed or 3-fid. *Standard* sub-orbicular, shortly clawed; wings obliquely-oblong or rarely obovate; keel incurved, obtuse or sub-rostrate, sub-equaling the standard. *Stamens* monadelphous; staminal-tube slit above and at length on 2 sides; anthers uniform. *Ovary* sessile or stalked, many-ovuled; style filiform, incurved; stigma small, terminal. *Pod* enclosed by the calyx, divided into 2 to many segments which at length separate. *Seeds* reniform, without an appendage.

Herbs, shrubs, or undershrubs; leaves impari- or paripinnate; stipules membranous or scarious, persistent; inflorescence often an axillary raceme; bracts and bracteoles sometimes scarious, persistent.

Species about 51, natives of Asia and Africa; 2 species in South Africa, recorded from the Transvaal, Natal, and East Griqualand.

3802

85. STYLOSANTHES, Swartz

Flowers unisexual, with occasional bisexual flowers; the fertile ones often apetalous. *Calyx-tube* filiform, with membranous lobes; the 4 upper lobes connate; the lowest lobe narrow, distinct. *Petals* inserted in the throat of the calyx-tube; standard orbicular; wings oblong; keel incurved, sub-rostrate. *Stamens* monadelphous, inserted at the apex of the calyx-tube; anthers unequal; the longer sub-basifixed; the shorter versatile. *Ovary* sub-sessile at the base of the calyx-tube, 2-3-ovuled; style long, filiform, after flowering broken at the middle or near the base, the portion that remains becoming curved; stigma minute, terminal. *Pod* sessile, compressed, hooked at the apex with the persistent style-base, divided into 1-2 reticulate or muricate segments. *Seeds* compressed, ovate or lenticular, without an appendage.

Perennial herbs or undershrubs, often viscid; leaves pinnately 3-foliate; stipules adnate to the petiole at the base; inflorescence a dense terminal or axillary spike or head, each in the axil of a leafy bract, or flowers solitary, 2-3-bracteolate, or in pairs, with one perfect and the other barren.

Species about 27, found in tropical Asia, Africa, and tropical and sub-tropical America; 1 species recorded from the Transvaal and Zululand.

3803

86. ARACHIS, Linn.

Calyx-tube filiform, with membranous lobes; the 4 upper lobes connate; the lowest lobe slender, distinct. *Petals* inserted in the throat of the calyx-tube; standard sub-orbicular; wings oblong; keel incurved, beaked. *Stamens* inserted in the throat of the calyx-tube, monadelphous, sometimes only 9 stamens present; anthers unequal; the longer sub-basifixed; the shorter versatile. *Ovary* sub-sessile at the base of the calyx-tube, 2-3-ovuled; the torus after the flower falls becoming an elongated deflexed rigid stalk forcing the fruit into the ground, acute at the apex, and after the style falls, terminated by a stigma-like callus; style long, filiform; stigma minute, terminal. *Pod* ripening beneath the soil, oblong, reticulated, indehiscent, sub-torulose. *Seeds* 1-3, irregularly ovoid.

Low herbs, often prostrate; leaves paripinnate; leaflets 2-jugate or rarely 3-foliate; stipules adnate to the base of the petiole; inflorescence a dense axillary sessile spike; bracts and bracteoles present.

Species 9, natives of Brazil; 1 species largely cultivated in South Africa.

3804

87. ZORNIA, Gmel.

Calyx membranous; the 2 upper lobes connate; the 2 lateral lobes much smaller; the lowermost oblong or lanceolate, sub-equalling the upper lip. *Standard* sub-orbicular, clawed; wings obliquely obovate or oblong; keel incurved, sub-rostrate. *Stamens* monadelphous; anthers unequal; the longer sub-basifixed; the shorter versatile. *Ovary* sessile, many-ovuled; style filiform; stigma small, terminal. *Pod* compressed, with the upper suture nearly straight and the lower deeply sinuate, breaking into smooth or spiny indehiscent segments. *Seeds* orbiculate-sub-reniform, without an appendage.

Herbs; leaves digitately 2-4-foliolate; leaflets often pellucid-dotted; stipules sub-foliaceous, often punctate; flowers solitary, or inflorescence an interrupted spike, with the peduncles terminal and axillary; bracts large and enclosing the flowers; bracteoles 0.

Species about 18, found in all warm regions, especially Brazil; 3 species in South Africa, extending from the Transvaal and Natal to Albany.

3807

88. DESMODIUM, Desv.

Calyx-tube short; the 2 upper lobes or teeth more or less connate; the 3 lower acute or subulate-acuminate. *Standard* oblong, obovate or orbicular, narrowed at the base or rarely obtuse or sub-cordate above the claw; wings obliquely-oblong, more or less united to the keel; keel somewhat straight, incurved or rarely sub-rostrate, obtuse. *Stamens* monadelphous or diadelphous; anthers uniform. *Ovary* sessile or stalked, 2 to many-ovuled; style inflexed or incurved, beardless; stigma terminal. *Pod* exerted from the calyx, sessile or stalked, compressed, divided into membranous or coriaceous flat or rarely turgid glabrous or villous segments which separate at maturity. *Seeds* compressed, orbicular-reniform, without an appendage.

Herbs, shrubs, or undershrubs, rarely small trees or sub-scandent; leaves pinnately 3-foliolate, very rarely 5-foliolate, sometimes 1-foliolate; stipules often striate, dry, free, or in 1 species opposite the leaves and joined; inflorescence a terminal, rarely sub-axillary, simple or paniced raceme, or rarely a shortly peduncled axillary raceme, or flowers clustered or solitary; bracts persistent or deciduous; bracteoles sometimes conspicuous and persistent, sometimes minute or 0.

Species about 214, in all tropical and sub-tropical countries; 8 species in South Africa, extending from the Transvaal and Natal to Komgha.

3808

89. PSEUDARTHRIA, Wight & Arn.

(Anarthrosyne, E.Mey.)

Calyx with the 2 upper lobes connate. *Standard* sub-orbicular; wings obliquely-oblong, free from the keel; keel oblong, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sub-sessile, many-ovuled; style inflexed, subulate; stigma terminal. *Pod* compressed, with the sutures straight or scarcely sinuate between the seeds, imperfectly articulated. *Seeds* compressed, sub-reniform, without an appendage.

Herbs or undershrubs, tomentose-villous or viscid-pubescent; leaves pinnately 3-foliolate; stipules free, membranous or striate; flowers small; inflorescence a raceme, with the racemes usually paniced; bracts narrow.

Species about , natives of Asia and Africa; 2 species in South Africa, found in the Transvaal, Swaziland, Natal, and southwards to Kentani.

3810

90. ALYSICARPUS, Neck.

Calyx deeply cut, rigidly glumaceous ; the two upper lobes often connate almost to the apex. *Standard* obovate or orbicular, narrowed into a claw ; wings obliquely-oblong, adnate to the keel ; keel slightly incurved, obtuse, with a membranous appendage on one or both sides. *Stamens* diadelphous. *Ovary* sessile or shortly stalked, many-ovuled ; style filiform, incurved at the apex ; stigma terminal, broadly capitate. *Pod* sub-terete or somewhat compressed, constricted between the seeds into segments ; segments often equal-sided, convex or turgid. *Seeds* sub-orbicular or globose, without an appendage.

Diffuse or erect glabrous or silky-pilose herbs ; leaves 1-foliate, very rarely 3-foliate ; stipules scarious, acuminate, free or connate ; inflorescence a terminal rarely axillary raceme ; bracts scarious, often deciduous.

Species about 16, found in Africa and Asia ; 4 species in South Africa, extending from the Transvaal, Swaziland, and Natal to Komgha.

3819

91. HALLIA, Thunb.

Calyx attenuated at the base ; lobes sub-equal. *Standard* clawed, obovate or orbicular ; wings obliquely-oblong, free or slightly adnate to the keel ; keel incurved at the apex, obtuse, sub-equalling or shorter than the wings. *Stamens* monadelphous, rarely diadelphous ; anthers uniform. *Ovary* sessile, 1-ovuled ; style inflexed above, dilated at the bend, subulate at the apex ; stigma terminal, capitate. *Pod* ovoid, included in the calyx ; valves membranous, reticulate. *Seed* without an appendage.

Diffuse or prostrate herbs or undershrubs ; leaves 1-foliate ; stipules striate, adnate to the base of the petiole ; flowers solitary, axillary ; pedicels articulated above the middle and bearing a small 3-fid bract ; bracteoles 0.

Endemic ; species 6, extending from the south-western districts through the coastal belt to the Transkei.

3821

92. DALBERGIA, Linn. f.

Calyx with the 2 upper teeth broader ; the lowest often longest. *Standard* ovate or orbicular ; wings oblong ; keel obtuse, with the petals connate at the apex. *Stamens* monadelphous, or diadelphous, or in 2 bundles owing to the staminal-sheath splitting on both sides ; the vexillary stamen sometimes absent ; anthers small, erect, didymous, shortly opening at the apex or rarely longitudinally splitting. *Ovary* stalked, few-ovuled ; style incurved, short ; stigma small, terminal. *Pod* oblong or strap-shaped, usually thin and flat, 1-4-seeded, indehiscent, not thickened nor winged at the sutures.

Trees or high climbing shrubs ; leaves imparipinnate or very rarely 1-foliate ; flowers small, often numerous ; inflorescence an axillary or terminal dichotomous cyme or an irregular sub-cymose panicle ; bracts small, broad, sub-persistent ; bracteoles often minute.

Species about 198, found in all tropical countries ; 3 species in South Africa, recorded from the Transvaal, Zululand, and Natal.

3828

93. PTEROCARPUS, Linn.

Calyx turbinate at the base, often incurved, toothed or lobed, with the 2 upper teeth or lobes more or less connate. *Standard* orbicular or broadly ovate ; wings obliquely-ovate or oblong ; petals of the keel sub-similar or shorter than the wings, free or shortly connate dorsally. *Stamens* monadelphous, or the staminal-tube split on both sides forming two bundles, or the vexillary stamen free (diadelphous) ; anthers versatile. *Ovary* sessile

or stalked, 2-6-ovuled ; style filiform, shortly incurved ; stigma small, terminal. *Pod* compressed, indehiscent, orbicular or ovate, rarely oval-oblong, more or less oblique or falcate, with the style lateral or rarely terminal, bearing the seeds in the middle and more or less thickened or hardened, with a surrounding membranous wing or sharp ridge, sometimes almost completely attenuate-coriaceous or membranous. *Seeds* 1-3, separated by hard partitions.

Unarmed trees ; leaves imparipinnate ; flowers often large ; inflorescence a lax axillary and terminal raceme or panicle ; bracts and bracteoles small, caducous.

Species about 55, found in all tropical regions ; 3 species in South Africa, recorded from the northern Transvaal.

3834

94. LONCHOCARPUS, H.B. & K.

Calyx truncate, with the teeth very short or obsolete, rarely lobed and with the 2 upper lobes connate. *Standard* orbicular, ovate, or rarely oblong, with 2 appendages above the claw, or nude, often silky ; wings obliquely-oblong or falcate, slightly adnate to the keel above the claw ; keel sub-erect or curved, obtuse, with the petals slightly adnate along the back. *Stamens* monadelphous, with the vexillary stamen free at the base ; anthers versatile. *Ovary* more or less stalked, 2 to many-ovuled ; style incurved, filiform ; stigma small, terminal. *Pod* oblong or elongated, flat, membranous or leathery, indehiscent, with the style scar terminal ; sutures not winged, but the upper sometimes laterally dilated. *Seeds* 1-2, rarely many, compressed, reniform or sub-orbicular.

Trees or tall climbing shrubs ; leaves imparipinnate, rarely pinnately 3-foliate ; inflorescence a simple rarely paniced raceme, or flowers sometimes fasciated or 2-nate ; bracts small, caducous ; bracteoles caducous or sub-persistent.

Species about 104, native of tropical America, Africa, and Australia ; 2 species recorded from the Transvaal.

3852

95. VICIA, Linn.

Calyx-tube often oblique at the base, obtuse ; teeth or lobes sub-equal, or the 2 upper shorter and the lowermost the longest. *Standard* obovate or oblong, emarginate, clawed ; wings obliquely-oblong, adnate to the keel at the middle ; keel falcate-oblong or broad, shorter than the wings. *Stamens* diadelphous or more or less monadelphous ; staminal-tube obliquely-truncate at the mouth, filaments filiform ; anthers uniform. *Ovary* sessile or stalked, many-ovuled or rarely 2-ovuled ; style inflexed, filiform, hairy under the stigma, rarely glabrous ; stigma terminal. *Pod* compressed, 2-valved. *Seeds* globose or rarely compressed.

Annual or perennial twining and climbing herbs ; leaves pinnate, with the common petiole produced into a branched or rarely simple tendril ; leaflets many, rarely in 1-2 pairs ; stipules semi-sagittate at the base ; inflorescence a raceme, or flowers 1-2-nate ; bracts caducous, commonly minute ; bracteoles 0.

Described species over 260, but probably not all valid ; natives of the northern temperate hemisphere, south and west America ; some species naturalised in South Africa.

3854

96. LATHYRUS, Linn.

Calyx-tube often gibbous at the base or gibbous on the upper side. *Standard* broadly obovate or orbicular, emarginate, shortly clawed ; wings falcate-obovate or oblong, slightly adnate to the keel at the middle, or sub-free ; keel incurved, obtuse, shorter than the wings. *Stamens* diadelphous or more

or less monadelphous ; filaments filiform or dilated above ; staminal-tube evenly truncate at the mouth, anthers uniform. *Ovary* sub-sessile or stalked, many-ovuled, rarely 2-4-ovuled ; style inflexed, flattened above, bearded on the inner side ; stigma capitate. *Pod* compressed or sub-terete, 2-valved, many-seeded. *Seeds* globose, angled, or rarely compressed, with a slender aril.

Annual or perennial herbs ; leaves pinnate, with the common petiole ending in a tendril or bristle ; leaflets 2 to few-, or rarely many-, jugate ; stipules foliaceous, semi-sagittate, sub-equally sagittate or rarely entire at the base ; inflorescence a raceme, or flowers solitary ; bracts caducous, commonly minute ; bractcoles 0.

Species described about 248, but probably not all valid, found especially in the northern hemisphere and South America ; in South Africa only known under cultivation.

3855

97. PISUM, Linn.

Calyx-tube oblique at the base or gibbous on the posterior side ; lobes sub-equal or the 2 upper broader. *Standard* broadly obovate or sub-orbicular, shortly clawed ; wings falcate-oblong, adnate to the keel at the middle ; keel incurved, obtuse, shorter than the wings. *Stamens* diadelphous or partly monadelphous ; filaments slightly dilated above ; anthers uniform. *Ovary* sub-sessile, many-ovuled ; style inflexed, laterally compressed, with reflexed edges (hence grooved above), bearded on the inner face ; stigma sub-terminal. *Pod* compressed, obliquely-arcuate, 2-valved. *Seeds* sub-globose.

Diffuse or climbing herbs ; leaves pinnate, with the common petiole produced into a bristle or tendril ; leaflets 1-3-jugate ; stipules foliaceous, semi-cordate or semi-sagittate ; flowers large and solitary on an elongated axillary peduncle, or inflorescence a few-flowered raceme ; bracts caducous, minute ; bractcoles 0.

Species 6, natives of the Mediterranean Region and western Asia ; cultivated in South Africa.

3856

98. ABRUS, Linn.

Calyx truncate, with very short teeth ; the 2 upper teeth sub-connate. *Standard* ovate, more or less adnate below to the staminal tube ; wings narrow, falcate-oblong ; keel arcuate, longer and broader than the wings, sometimes gibbous. *Stamens* 9, monadelphous ; the vexillary stamen absent ; anthers uniform. *Ovary* sub-sessile, many-ovuled ; style short, incurved, beardless ; stigma capitate. *Pod* oblong or linear, compressed, 2-valved, sub-septate between the seeds. *Seeds* sub-globose or shortly oblong, shining.

Shrubs or undershrubs, with the branches often elongated and twining ; leaves abruptly pinnate, with the common petiole ending in a bristle ; leaflets many-jugate ; inflorescence an axillary raceme or racemose on short leafless axillary branches.

Species 6, natives in all tropical countries ; 2 species in South Africa, found in the north-eastern Transvaal, Natal, the Transkei, and also recorded from the Komgha district.

3861

99. DUMASIA, DC.

Calyx-tube cylindric, gibbous at the base on the upper side, with the mouth obliquely-truncate ; teeth obsolete. *Standard* obovate, erect, spurred on both sides above the claw ; wings falcate-obovate, adnate to the keel ; keel slightly incurved, obtuse, sub-equalling the wings. *Stamens* diadelphous ; anthers uniform. *Ovary* sub-sessile, many-ovuled ; style dilated about the middle, beardless ; stigma terminal. *Pod* sub-sessile, linear, compressed, falcate, torulose. *Seed* sub-globose, without an appendage.

Twining herbs ; leaves pinnately 3-foliolate ; stipules setaceous or striate ; inflorescence an axillary raceme, or flowers solitary or clustered on the rachis ; bracts small, narrow ; bracteoles minute.

Species about 7, natives of Asia and tropical Africa ; a single species in South Africa, extending from the Transvaal and Natal through the eastern districts to Knysna.

3864

100. GLYCINE, Linn.

Calyx with the 2 upper teeth more or less connate ; the others linear or lanceolate. *Standard* sub-orbicular, spreading, sub-auricled at the base ; wings narrow, slightly adnate to the keel ; keel obtuse, broader than the wings. *Stamens* monadelphous or more rarely more or less diadelphous ; anthers uniform. *Ovary* sub-sessile, many-ovuled ; style slightly incurved, often short, beardless ; stigma terminal, capitate. *Pod* linear or falcate, compressed or at length sub-terete, 2-valved, septate between the seeds. *Seeds* without an appendage.

Prostrate or twining herbs, rarely sub-erect ; leaves pinnately 3-, rarely 5-7-, foliate ; stipules small ; inflorescence a raceme, with the flowers small, solitary or fascicled on the axis ; bracts small, setaceous ; bracteoles narrow or very small.

Species about 31, found in all tropical and sub-tropical regions ; 3 species in South Africa, found in the Transvaal and Natal.

3865

101. NEORAUTANENIA, Schinz

Calyx with the 2 upper lobes distinct. *Standard* with 2 auricles at the base ; wings narrow, free from the keel ; keel incurved, obtuse. *Stamens* diadelphous. *Ovary* sessile, about 4-ovuled ; style inflexed, thickened at the base, glabrous ; stigma capitate. *Pod* oblong, septate between the seeds. *Seeds* sub-globose, without an appendage.

Climbing (?) herbs ; leaves 3-foliolate ; bracts and bracteoles not seen. Endemic ; species 1, found in S. W. Africa.

3866

102. TERAMNUS, Swartz

Calyx with the 2 upper lobes connate or distinct. *Standard* obovate, narrowed at the base, without appendages ; wings narrow, adnate to the keel ; keel almost straight, obtuse, shorter than the wings. *Stamens* monadelphous ; alternate anthers small, abortive. *Ovary* sessile, many-ovuled ; style short, thick, beardless ; stigma capitate. *Pod* linear, 2-valved, septate between the seeds, tipped with the persistent and hooked style.

Twining herbs ; leaves pinnately 3-foliolate ; stipules small ; flowers small, fascicled in the leaf-axils, or inflorescence an axillary raceme ; bracts small ; bracteoles linear or lanceolate.

Species 7, found in all tropical regions ; 1 species recorded from the Transvaal, Natal, and the eastern districts to Komgha.

3870

103. ERYTHRINA, Linn.

Calyx truncate, bilabiate, or cleft on one side and spathaceous. *Standard* ample or elongate, erect or spreading, sub-sessile or long-stalked, without appendages at the base ; wings short, sometimes small or 0 ; keel with the petals free or connate on the back, much shorter than the standard, longer or shorter than the wings. *Stamens* diadelphous or imperfectly monadelphous ; anthers uniform. *Ovary* stalked, many-ovuled ; style incurved, subulate at the apex, beardless ; stigma small, terminal. *Pod* stalked,

linear, falcate, attenuated at the base, compressed or sub-terete, constricted between the seeds or sinuate, 2-valved or indehiscent. *Seeds* ovoid, without appendages.

Trees or shrubs, sometimes acaulescent, with the branches often thick and prickly; leaves pinnately 3-foliolate; stipules small; flowers large; inflorescence a leafless axillary or terminal raceme, leafy at the base; bracts and bracteoles small or 0.

Species about 73, in all tropical and sub-tropical regions; 7 species found in South Africa, extending from the Transvaal, Natal, the eastern Orange Free State and Basutoland, through the eastern districts to Uitenhage.

3877

104. MUCUNA, Adans.

Calyx with the 2 upper teeth connate and the lowest longer than the two lateral. *Standard* folded together, about as long as the wings, auricled at the base; wings oblong or ovate, incurved, often adhering to the keel; keel incurved at the apex or rostrate, equalling or longer than the wings. *Stamens* diadelphous; anthers unequal; the longer sub-basifixed; the shorter often bearded and versatile. *Ovary* sessile, villous, few-ovuled; style filiform, beardless; stigma small, terminal. *Pod* thick, ovate, oblong or linear, often covered with stinging hairs, 2-valved, septate between the seeds. *Seeds* round or transversely oblong.

Herbs, or tall climbing shrubs, or rarely short and erect; leaves pinnately 3-foliolate; stipules deciduous; inflorescence an axillary raceme; flowers large, with the pedicels clustered along the rhachis on lateral nodes, or on short peduncles when the raceme is converted into a corymb or dense panicle; bracts small or caducous.

Species about 81, found in all warm countries; 2 species recorded from the Transvaal.

3882

105. GALACTIA, P.Br.

Calyx-lobes acuminate; usually the 2 upper completely fused, rarely 2-toothed or 2-lobed; the lateral smaller; the lowermost often longest. *Standard* ovate or orbicular, with the margin scarcely slightly inflexed at the base or sub-appendiculate; wings narrow or obovate, adnate to the keel; keel sub-equalling or exceeding the wings. *Stamens* diadelphous or the vexillary stamen connate with the others at the middle; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, beardless; stigma small, terminal. *Pod* linear, straight or incurved, compressed, very rarely convex on both sides, 2-valved. *Seeds* without an appendage.

Prostrate or climbing herbs, or erect shrubs; leaves pinnately 3-foliolate (in the South African species), rarely 1-5- or 7-foliolate; stipules small, often deciduous; inflorescence an axillary raceme, with the flowers fascicled on the peduncle or the lower sub-solitary; rhachis thickened at the insertion of the pedicels; bracts small, setaceous; bracteoles very small.

Species about 96, found in all warm regions; 11 species recorded from the Transvaal and Natal. (Note.—The plant named *G. tenuiflora*, W. & A. in the *Flora Capensis* is not this species but *G. subsericea*, Burt Davy = *Copisma subsericeum*, Sond.).

3889

106. PUERARIA, DC.

Calyx usually with the 2 upper lobes or teeth completely connate or 2-toothed, rarely 2-lobed. *Standard* obovate or sub-orbicular, appendaged with inflexed auricles; wings narrow-oblong or obovate-falcate, often adnate to the keel at the middle; keel somewhat straight, or incurved-dilated at the apex, or arcuate and rostrate, sub-equalling the wings. *Stamens* more or less monadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, inflexed above, beardless; stigma small, capitate. *Pod*

elongated, 2-valved, sometimes septate between the seeds. *Seeds* compressed, sub-orbicular or transversely oblong.

Climbers; leaves pinnately 3-foliate; stipules herbaceous, sometimes produced below; flowers large or small, densely fascicled in long often compound racemes.

Species about 37, found in Africa, tropical Asia, Japan, and New Guinea; 2 species recorded from the Transvaal.

3891

107. CANAVALIA, DC.

Calyx 2-lipped; the upper lip large, truncate or 2-lobed; the lower smaller, sub-entire or 3-fid. *Standard* large, sub-orbicular, reflexed; wings narrow, falcate or sub-twisted, free; keel wider than the wings, incurved, obtuse, or obtusely-beaked, with the beak inflexed or spiral. *Stamens* monadelphous or imperfectly diadelphous; anthers uniform. *Ovary* sub-sessile, many-ovuled; style incurved or folded with the keel, beardless; stigma small, terminal. *Pod* oblong or broadly linear, compressed or turgid, 2 valved. *Seeds* roundish, compressed.

Twining or prostrate herbs; leaves pinnately 3-foliate; stipules small, wart-shaped, or inconspicuous; inflorescence an axillary raceme; flowers often large, usually clustered along the peduncle.

Species 22, found in all warm regions; 4 species recorded from South Africa, extending from the Transvaal and Natal to Komgha.

3892

108. CAJANUS, DC.

Calyx-lobes acuminate or acute; the 2 upper connate and 2-toothed. *Standard* orbicular, reflexed, with inflexed auricles at the base; wings obliquely obovate; keel incurved at the apex, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sub-sessile, many-ovuled; style thickened above the middle, beardless; stigma terminal. *Pod* linear, obliquely and long-acute, compressed, 2-valved, constricted between the seeds. *Seeds* somewhat compressed, without an appendage.

Erect undershrub, often tomentose; leaves pinnate, 3-foliate; leaflets with minute resin dots beneath; stipules caducous; inflorescence an axillary raceme; bracts very caducous; bracteoles 0.

Species 1, probably a native of Asia, now widely cultivated in all warm countries.

3893

109. FAGELIA, Neck.

Calyx-lobes acuminate; the 2 upper shortly connate. *Standard* sub-orbicular, reflexed, auricled at the base; wings narrow, shorter than the keel; keel incurved, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style inflexed at the middle, filiform or slightly thickened; stigma small, terminal. *Pod* oblong-falcate, acute, turgid, 2-valved, sub-depressed between the seeds. *Seeds* ovoid, appendaged.

A twining herb, sub-woody at the base, sticky, scented; leaves pinnately 3-foliate; stipules striate; flowers large; inflorescence an axillary raceme; bracts ovate, caducous; bracteoles 0.

Endemic; species 1, confined to the south-western districts.

3897

110. RHYNCHOSIA, Lour.

Calyx campanulate, mostly oblique, 4-5-fid; the 2 upper lobes more or less united; the lowest lobe the longest. *Standard* obovate or orbicular, spreading or reflexed, auricled at the base; wings narrow; keel incurved at the apex. *Stamens* diadelphous; vexillary stamen mostly kneed; anthers uniform. *Ovary* sub-sessile, 2-ovuled, very rarely 1-ovuled; style incurved

above, filiform or thickened; stigma small, terminal. *Pod* compressed, obliquely orbicular, oblong or falcate, 2-valved, rarely septate. *Seeds* 2, very rarely 1, compressed-globose or sub-reniform; funicle in centre of the hilum.

Herbs or undershrubs, twining, prostrate, or rarely erect; leaves pinnately, rarely sub-digitately, 3-foliolate, rarely 1-foliolate; leaflets usually with resinous dots; stipules ovate or lanceolate; inflorescence a raceme or axillary umbel, or flowers in dense oblong or sub-sessile clusters or solitary; bracts caducous; bracteoles 0.

Species over 150, found in all warm regions; 53 species in South Africa, widely distributed.

3898

111. ERIOSEMA, DC.

Calyx-lobes all distinct or the 2 upper rarely shortly connate. *Standard* obovate or oblong, auricled at the base; wings narrow; keel slightly incurved at the apex, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, 2-ovuled; style filiform or slightly thickened above; stigma small, terminal. *Pod* compressed, obliquely orbicular, rhomboid or broadly oblong, 2-valved. *Seeds* 2, rarely 1, compressed, obliquely transverse; funicle attached at one end of the hilum.

Herbs or undershrubs, erect, prostrate, or rarely twining; leaves pinnately 3-foliolate; leaflets resin-dotted, but less conspicuously than in *Rhynchosia*; stipules lanceolate, free or rarely connate; inflorescence an axillary raceme, with the flowers solitary or fascicled on the rhachis, rarely the flowers axillary and sub-solitary.

Species about 100, natives of tropical Africa, America and Australia, and southern Asia; 17 species in South Africa, extending from the Transvaal, Natal, Basutoland, through the eastern districts to Humansdorp.

3899

112. FLEMINGIA, Roxb.

Calyx-lobes sub-equal or the lowest longer, free, often falcate. *Standard* elliptic, obovate, or orbicular, with inflexed auricles at the base; wings obliquely-obovate or oblong, often adhering to the keel; keel somewhat straight or incurved, obtuse or acute. *Stamens* diadelphous; anthers uniform. *Ovary* sub-sessile, short, 2-ovuled; style filiform or slightly thickened above; stigma small, terminal. *Pod* short, oblique, turgid, 2-valved. *Seeds* somewhat thick, without an appendage.

Herbs, undershrubs, or shrubs, erect, prostrate, or rarely twining; leaves digitately 3-foliolate or 1-foliolate; stipules striate, often caducous; inflorescence a dense spicate raceme or panicle; bracts broadly foliaceous, concave, persistent, exceeding the flowers, sometimes narrow, persistent or caducous; bracteoles 0.

Species about 37, found in all tropical regions; 3 species recorded from the Transvaal and Natal.

3901

113. PHASEOLUS, Linn.

Calyx with the 2 upper teeth or lobes connate or free. *Standard* orbicular, recurved-spreading or sub-twisted, with the margins at the base inflexed and sub-appendaged; wings obovate or rarely oblong, equalling or exceeding the standard, adhering to the keel above the claw, often twisted; keel linear or obovate, with a long obtuse spirally twisted beak. *Stamens* diadelphous; the vexillary stamen free, often thickened or appendiculate above the base; anthers uniform. *Ovary* sub-sessile, many-ovuled; style within the beak of the keel, thickened and twisted with it, very often longitudinally bearded above; stigma oblique or lateral. *Pod* linear or falcate, sub-terete or compressed, 2-valved. *Seed* thickened, without an appendage.

Herbs, rarely woody at the base, twining, prostrate, or shortly erect; leaves pinnately 3-foliolate, very rarely 1-foliolate; stipules persistent, striate; inflorescence a raceme, with the flowers clustered on the peduncle; bracts often caducous, similar to the stipules or small; bracteoles often broad, sometimes long persistent.

Species about 150, found in all warm regions; some species cultivated in South Africa.

3903

114. VOANDZEIA, Thouars

Calyx with the 2 upper teeth or lobes completely connate; the lowest longer than the others. *Standard* orbicular, with small inflexed auricles at the base; wings oblong-obovate; keel equalling the wings, slightly incurved, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sub-sessile, few-ovuled; style incurved, bearded above; stigma lateral. *Pod* maturing under the ground, irregularly sub-globose, 2-valved, 1-seeded by abortion. *Seeds* sub-globose.

Creeping herbs; leaves long petioled, 3-foliolate; flowers dimorphic; the bisexual flowers small, sterile; fertile flowers without petals; peduncle short, axillary, few-flowered, recurved; bracts and bracteoles small, striate.

Species 1, native of tropical Africa; cultivated in parts of South Africa.

3905

115. VIGNA, Savi.

Calyx with the 2 upper teeth or lobes connate or free. *Standard* orbicular, with inflexed auricles at the base; wings falcate-obovate, a little shorter than the standard; keel sub-equalling the wings, incurved, either obtuse or with an obliquely incurved beak, not forming a complete spire. *Stamens* diadelphous or monadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, or thickened, or dilated above, bearded on the inner side; stigma very oblique or on the inner side of the style. *Pod* linear, straight or scarcely incurved, sub-terete, 2-valved. *Seeds* reniform or sub-quadrate, without an appendage.

Herbs, twining or prostrate, rarely shortly erect; leaves pinnately 3-foliolate; stipules sessile or rarely produced beyond the point of insertion; flowers solitary, or inflorescence a raceme, with the flowers fascicled on the peduncle; bracts and bracteoles small, caducous.

Species about 90, found in all tropical regions: 13 species in South Africa, extending from the Transvaal and Natal through the eastern districts to Uitenhage; also recorded from Queenstown.

3910

116. DOLICHOS, Linn.

Calyx campanulate; lobes or teeth short, often obtuse; the 2 upper completely connate or emarginate at the apex. *Standard* orbicular, with inflexed auricles at the base; wings falcate-obovate, adhering to the keel; keel strongly incurved, often rostrate, not spiral. *Stamens* diadelphous, often thickened or appendiculate near the base; anthers uniform. *Ovary* sub-sessile, many-ovuled; style thickened above and longitudinally bearded beneath the stigma or penicillate at the apex; stigma terminal. *Pod* falcate or linear, compressed, 2-valved, with the sutures often thickened and the valves flat or convex. *Seeds* thick or compressed.

Herbs or undershrubs, twining, prostrate, or shortly erect; leaves pinnately, rarely digitately, 3-foliolate; stipules small; flowers axillary, solitary or fascicled, or inflorescence an axillary raceme; bracts and bracteoles striate, often small or very caducous.

Species about 100, natives of the warm parts of Africa, Asia, and Australia; a few in South America; 18 species in South Africa, extending from the Transvaal, Natal, Basutoland, through the eastern districts to the Cape; also recorded from Queenstown and Barkly West.

3910a

117. ALISTILUS, N.E.Br.

Calyx shortly 5-toothed; the lowest tooth acute; the others rounded or obtuse. *Standard* orbicular, very shortly bilobed at the apex, bicallos at the base; wings with pouches near the base, not hooked; keel incurved, obtuse. *Stamens* monadelphous in the middle, diadelphous at the base and apex, the free stamen appendiculate at the base. *Ovary* linear, with 5 ovules; style abruptly inflexed, flat, 2-winged, obcuneate and glabrous at the apex; stigma truncate.

A procumbent herb, not twining; leaves pinnately 3-foliate; leaflets densely ciliate on the margins; inflorescence a raceme; bracts 0.

Endemic; species 1, recorded from Bechuanaland.

86. GERANIACEÆ.

Flowers bisexual, regular or rarely irregular. *Sepals* 5, rarely 4, free or rarely connate to the middle, imbricate, rarely valvate, rarely the uppermost spurred. *Petals* 5, rarely 4 or 2, very rarely 0 by abortion, mostly equal, hypogynous or sub-perigynous, imbricate, rarely contorted. *Stamens* twice as many as the sepals, rarely 3 times as many, sometimes by abortion reduced to 2-9 or 7, all fertile or the alternate without anthers; filaments free, or more or less connate at the base, sometimes connate in 5 bundles of 3 each; anthers versatile, 2-theous, opening by longitudinal slits. *Ovary* superior, 3-5-lobed, rarely 2-lobed, 3-5-chambered, with 1-2 pendulous ovules in each chamber, beaked; styles adhering to the beak; stigmas ligulate, very rarely capitate. *Fruit* 3-5- (rarely 8-) lobed, breaking away from the beak into 1-seeded parts (mericarps), rarely 2 to many-seeded. *Seeds* pendulous; embryo curved and folded, with leafy cotyledons; endosperm 0, rarely present.

Herbs, shrubs, or undershrubs, rarely trees; leaves opposite or alternate, toothed, lobed, dissected, or compound, rarely entire; stipules rarely absent; flowers on 1-2-flowered axillary peduncles, or in many-flowered umbels, rarely solitary and axillary; bracts present or 0.

Genera 5, species almost 600, natives of temperate and sub-tropical regions.

Tribe **Geranieæ**: Sepals imbricate; flowers regular or sub-regular; disc glands alternating with the petals; fertile stamens as many as or two to three times as many as the petals (genera 1-4).

Tribe **Pelargonieæ**: Flowers irregular; the uppermost sepal spurred; petals perigynous; the 2 upper exterior; disc 0; stamens declinate; fertile stamens not equalling the number of petals (genus 5).

1. Flowers irregular; stamens 10, usually only 2-7 bearing anthers

5. *Pelargonium*, L'Her.

Flowers regular; stamens 10-15, all perfect or the alternate without

- | | | |
|-------------------------|--|---|
| anthers | | 2 |
| 2. Stamens 15 | | 3 |
| Stamens 10 | | 4 |

3. Stems thick and succulent, covered with the persistent spine-like petioles

3. *Sarcocaulon*, DC.

Stems not succulent and not covered with the persistent petioles

2. *Monsonia*, Linn.

4. Tails of the carpels arched, generally glabrous; fertile stamens usually 10; petals mostly notched; flowers usually solitary or in pairs

1. *Geranium*, Linn.

Tails of the carpels spirally twisted, hairy; fertile stamens 5; petals entire; flowers usually in umbels

4. *Erodium*, Linn.

3924

1. GERANIUM, Linn.

Flowers regular. *Sepals* 5, imbricate. *Petals* 5, mostly notched, hypogynous, imbricate. *Disc* of 5 glands, alternating with the petals. *Stamens* 10, all perfect, very rarely 5 without anthers, free or shortly connate at the base. *Ovary* 5-lobed, 5-chambered, beaked, with 2 ovules in each chamber; styles adhering to the beak; stigmas 5. *Mericarps* distinct, 1-seeded, separating at maturity from the persistent enlarged beak, with the tails arched, generally glabrous. *Seeds* with thin endosperm. or endosperm 0; embryo curved and folded, with leafy cotyledons.

Herbs, rarely undershrubs, or very rarely shrubs, sometimes tufted; branches often jointed; leaves opposite or alternate, petioled, palmately-lobed or dissected, rarely toothed; stipules present; flowers 1-2-nate on axillary peduncles, rarely peduncle aborted.

Species about 250, mostly massed in the temperate regions; 17 species in South Africa, extending from the Transvaal, Natal, and Basutoland through the coastal belt to the Cape.

3925

2. MONSONIA, Linn.

Flowers regular. *Sepals* 5, imbricate. *Petals* 5, hypogynous, imbricate. *Disc* of 5 glands, alternating with the petals. *Stamens* 15, all fertile, connate at the base and spreading in 5 bundles, each bundle consisting of 3 stamens whose filaments cohere for half their length. *Ovary* 5-lobed, 5-chambered, beaked, with 2 ovules in each chamber; styles adhering to the beak; stigmas 5. *Mericarps* 1-seeded, separating at maturity from the beak. *Seeds* without endosperm.

Herbs or undershrubs, erect or decumbent; leaves opposite or alternate, crenate-toothed or dissected; stipules present; flowers sometimes solitary, more usually 2 or few in a peduncled umbel; peduncle bracteate above the middle.

Species 29, natives of Africa, western Asia, and eastern India; 25 species in South Africa, widely distributed.

3926

3. SARCOCAULON, DC.

Flowers regular. *Sepals* 5, imbricate. *Disc* of 5 glands, alternating with the petals. *Stamens* 15, all perfect; filaments very shortly connate at the base into a ring, sometimes united into 5 bundles of 3 each. *Ovary* 5-lobed, 5-chambered, rostrate, with 2 ovules in each chamber; styles adhering to the beak; stigmas 5. *Mericarps* 1-seeded. *Seeds* without endosperm.

Fleshy or succulent undershrubs, armed with the persistent petioles; leaves tufted or solitary in the axils of the thorns, sometimes with a leaf-blade (which is soon deciduous) on the spinous petioles; flowers solitary, peduncled; peduncles bracteate at the base, but bracts soon deciduous.

Endemic; species 7, found in the central, western and north-western districts; also recorded from the Fish River Valley and near Middelburg in the King William's Town district.

3927

4. ERODIUM, L'Her.

Flowers regular or scarcely zygomorphic. *Sepals* 5, imbricate. *Petals* 5, entire, hypogynous, imbricate; the 2 upper sometimes a little different to the 3 lower. *Disc* of 5 glands, alternating with the petals. *Stamens* 10; perfect stamens 5, opposite the sepals, shortly connate at the base or almost free; 5 stamens without anthers, often scale-like, opposite the petals. *Ovary* 5-lobed, 5-chambered, beaked, with 2 ovules in each chamber; styles adhering to the beak; stigmas 5. *Mericarps* 1-seeded, with the tails spirally twisted, hairy. *Seeds* without endosperm.

Herbs, very rarely undershrubs, or tufted; branches often articulated; leaves opposite or alternate, pinnately lobed or dissected, more or less toothed; stipules present; inflorescence usually an umbel, rarely 1-flowered by abortion.

Species about 60, natives of Europe, Africa, central and temperate America, Asia, and Australia; about 6 species recorded from South Africa, but all introductions.

3928

5. PELARGONIUM, L'Her.

Flowers irregular. *Sepals* 5, imbricate, connate at the base; the uppermost segment produced at the base into a slender nectariferous tube which is decurrent along the pedicel and adnate to it. *Petals* 5, or rarely 2-4 by abortion, more or less unequal, hypogynous, imbricate. *Disc* 0. *Stamens* 10, connate at the base, 2-7 bearing anthers, the rest without anthers or rudimentary. *Ovary* 5-lobed, 5-chambered, beaked, with 2 ovules in each chamber; styles adhering to the beak; stigmas 5. *Mericarps* 1-seeded. *Seeds* without endosperm.

Herbs, shrubs, or undershrubs, often fleshy, glabrous, pubescent, or silky, often viscid and aromatic; leaves opposite or rarely alternate, entire, toothed, lobed, or pinnatifid, more rarely compound; stipules present; inflorescence a 2 to many-flowered umbel, rarely flowers sub-solitary.

Species 232 (besides many hybrids), mostly South African; a few are found in tropical Africa, Australia, and Syria. In South Africa the species are widely distributed, but particularly numerous in the south-eastern area.

87. OXALIDACEÆ.

Flowers bisexual, regular, more rarely of two kinds (perfect, and minute and apetalous). *Calyx* 5-parted, imbricate. *Petals* 5, clawed, free, or united at the base, with contorted aestivation. *Stamens* 10, of unequal lengths; the 5 opposite the petals shorter than the others; filaments slightly connate at the base; anthers 2-theous, opening inwards. *Ovary* superior, 5-lobed, 5-chambered, with few to many ovules in each chamber, and with axile placentation; styles 5, free, filiform; stigmas capitate, penicillate. *Fruit* a capsule or berry. *Seeds* 1 to many, pendulous; embryo straight or curved; endosperm copious, fleshy.

Stemless or caulescent herbs, often with tuberous roots, rarely shrubs, undershrubs, or trees; leaves alternate, simple or compound; stipules 0; inflorescence an umbel, raceme, or panicle cyme, or flowers solitary.

Genera 7, with about 350 species, natives of Africa, Madagascar, North and South America, Asia, and the Malay Archipelago.

3936

1. OXALIS, Linn.

Sepals 5, free or united at the base. *Petals* 5, convolute, with the claws connate into a tube. *Stamens* 10. *Ovary* 5-lobed, 5-chambered; styles 5; stigmas capitate or penicillate. *Capsule* deeply 5-lobed, with 1 or several seeds.

Mostly herbs, rarely undershrubs, with a bulbous rootstock, rarely with a fleshy rhizome; leaves alternate, simple, digitately or pinnately 3 to many-foliate; flowers solitary, or inflorescence an umbel.

Species over 400; 136 (probably more) species native in South Africa, mostly massed in the south-western districts, but extend through the coastal belt into Natal and the Transvaal; a few species found in the central districts.

88. LINACEÆ.

Flowers regular, bisexual. *Calyx* 4-5-partite, or sepals free, persistent, imbricate in æstivation. *Petals* equalling the number of sepals, free, tapering to the base, twisted in æstivation, fugacious. *Stamens* as many as the petals and alternating with them; filaments subulate, slightly connate at the base; anthers 2-chambered, opening inwards; staminodes sometimes present and alternating with the stamens. *Ovary* superior, 3-5-chambered, with 2 axile ovules in each chamber; styles 3-5, free or more or less connate. *Fruit* a globose septicidal capsule, incompletely 8-10-locular. *Seeds* pendulous, compressed; embryo with flat cotyledons; endosperm copious, scanty, or 0.

Annual or perennial herbs or undershrubs; leaves alternate or opposite, rarely whorled, simple, entire; stipules present or 0; inflorescence a panicle or cyme.

Genera 10, with about 120 species, widely dispersed, but mainly in the temperate regions.

3945

1. LINUM, Linn.

Sepals 5, entire. *Petals* 5, sometimes adhering slightly above the base. *Stamens* 5, hypogynous, perfect; staminodes 5, tooth-like. *Hypogynous glands* 5, small, adnate to the outside of the staminal-tube, opposite the petals. *Ovary* 5-chambered; styles 5, free or rarely more or less united; stigmas capitate, oblong or linear. *Fruit* 5-valved, 5-locular, sometimes spuriously 10-locular and each loculus 1-seeded. *Seed* with scanty endosperm and a straight embryo.

Herbs or undershrubs, glabrous or rarely pubescent; leaves alternate or very rarely opposite, narrow, entire; stipules 0 or gland-like; inflorescence a terminal or axillary raceme, sometimes a lax sub-corymbose raceme, or spicate head, or flowers in contracted fascicles.

Species about 136, widely dispersed in the temperate and sub-tropical regions; 4 species in South Africa, extending from the Transvaal, Natal, and Basutoland, through the coastal belt to Clanwilliam; also recorded from a few inland districts.

89. ERYTHROXYLACEÆ.

Flowers bisexual. *Sepals* 5, rarely 6, free or more or less connate. *Petals* as many as the sepals, usually 5, free, imbricate, deciduous, usually with a transverse bifid scale at the base of the limb, rarely nude, but if so then the texture of the claw different to that of the limb. *Stamens* twice as many as the petals, usually 10; filaments connate at the base. *Ovary* superior, 2-5-chambered, with 1-2 ovules in each chamber, sometimes all the chambers but one suppressed; styles 3-5, free or more or less joined. *Fruit* a drupe. *Seeds* with fleshy endosperm, rarely endosperm 0; embryo straight.

Shrubs or trees; leaves alternate or opposite, simple, entire, rarely slightly crenate; stipules usually intrapetiolar, persistent or caducous; flowers solitary or fascicled, or inflorescence a panicle of cymes; bracts present or 0.

Genera 3; species about 120, mostly African, rare in South America.

Leaves rounded at the apex; styles free or connate at the base

1. *Erythroxylon*, Linn.

Leaves acuminate; style simple 2. *Nectaropetalum*, Engl.

3956

1. ERYTHROXYLON, Linn.

Sepals 5, rarely 6, more or less connate or free. *Petals* as many as the sepals, imbricate, deciduous, with an erect transverse usually 2-fid or variously thickened scale on the inner face. *Stamens* 10, rarely 12, connate below into a short eglandular or glandular tube. *Ovary* superior, 3- (rarely 4-) chambered, with 1 or rarely 2 ovules in each chamber (sometimes at the time of flowering all the chambers but one suppressed); styles 3, rarely 4, free or more or less united, capitate or clavate at the apex. *Fruit* a thin 1-locular 1-seeded drupe. *Seeds* with a straight embryo; endosperm copious, scanty, or 0.

Shrubs or trees; leaves alternate, membranous or coriaceous, entire; stipules intrapetiolar, persistent or deciduous, sometimes branchlets leafless and stipules crowded towards the extremities leaving conspicuous scars; flowers small, pedicelled, solitary or fascicled.

Species about 187, natives of tropical and sub-tropical regions; 4 species in South Africa, occurring in the Transvaal, Zululand and Natal and through the coastal belt to East London.

3956a

2. NECTAROPETALUM, Engl.

(Peglera, Bolus).

Calyx 5- (rarely 4-) partite. *Petals* 5, rarely 4, clawed, much longer than the calyx, with a bilobed scale at the base of the lamina, or nude, but the texture distinct from that of the claw. *Stamens* twice as many as the petals, connate at the base into a short tube. *Ovary* 2-chambered, with a solitary pendulous ovule in each chamber; style simple, exceeding the anthers; stigmas 2, short, ovate, recurved. *Fruit* unknown.

Trees or shrubs, with the young branches covered with scars; leaves alternate, entire; stipules intrapetiolar, connate, acute; flowers very shortly pedicelled, axillary, solitary, or few and fascicled.

An African genus of 4 species; 2 species in South Africa, found in Zululand, Natal, and the Transkei.

90. ZYGOPHYLLACEÆ.

Flowers bisexual, rarely unisexual, regular or irregular. *Sepals* 5, rarely 4, free or connate at the base, persistent or deciduous, with imbricate or rarely valvate æstivation. *Petals* 4-5, rarely 0, free, with imbricate or contorted, rarely valvate, æstivation. *Disc* convex or depressed, rarely annular, inconspicuous, or 0. *Stamens* as many as or twice as many as the petals, rarely three times as many, hypogynous; filaments naked or with scales at the base; anthers 2-theous opening inwards. *Ovary* superior, sessile or rarely on a short gynophore, furrowed, angled, or winged, sometimes hirsute, 4-5- (rarely 2-12-) chambered, with 2 to many pendulous ovules in each chamber, rarely ovule 1; style simple, more rarely styles free; stigma simple, very rarely discoid. *Fruit* usually a capsule, sometimes breaking up into cocci, rarely a drupe, glabrous, densely covered with long hairs, or sometimes tuberculate or spinescent. *Seeds* very often pendulous and solitary; embryo straight or rarely curved; endosperm copious or 0.

Herbs, shrubs, or undershrubs, rarely trees; leaves often fleshy, usually opposite, very rarely alternate or sub-opposite, 2-foliate, rarely 1-foliate, more rarely 3-foliate or pinnate; leaflets entire; stipules persistent, sometimes spinescent; flowers usually peduncled, solitary or 2-nate, rarely inflorescence a cyme; bracts present or absent.

Genera 27, species over 100, found principally in the tropics and warm regions of the northern and southern hemispheres.

1. Spiny shrubs or trees ; leaves alternate, 2-foliolate ; fruit a drupe
 8. *Balanites*, Delile.
- Herbs, shrubs, or undershrubs, sometimes spiny ; leaves opposite, simple, 2-3- or many-foliolate, if sub-opposite or fascicled then ovary hairy and fruits covered with long hairs ; fruit a capsule, or breaking up into separate cocci 2
2. Ovary hirsute ; fruits densely covered with long hairs 3
 Ovary glabrous, rarely hirsute, if so then leaves pinnate and fruits spinose or tuberculate 4
3. Leaves fascicled at the nodes ; fruits covered with plumose hairs
 5. *Neoluederitzia*, Schinz
- Leaves simple, sub-opposite, or stems almost leafless ; fruits covered with long simple hairs 6. *Sisyndite*, E. Mey.
4. Styles free ; petals 0 2. *Seetzenia*, R. Br.
 Style simple ; petals present, or represented by 10 linear bifid or trifid scales 5
5. Leaves simple, connate at the base ; filaments 3-fid, with the middle lobe bearing an anther
 4. *Augea*, Thunb.
- Leaves 2-3-foliolate or many-pinnate, rarely simple, but then filaments not divided 6
6. Leaves many-pinnate ; ovary hirsute ; fruits spinescent or tuberculate
 7. *Tribulus*, Tourn.
- Leaves 2-3-foliolate or simple ; ovary glabrous ; fruits often 4-5-angled or winged 7
7. A diffuse or prostrate herb ; filaments nude 1. *Fagonia*, Tourn.
 Small shrubs or undershrubs ; filaments with a bifid or 2-partite scale at the base 3. *Zygophyllum*, Linn.

3963

1. FAGONIA, Tourn.

Sepals 5, deciduous, imbricate. *Petals* 5, clawed, caducous, imbricate. *Disc* short, inconspicuous. *Stamens* 10, inserted on the disc ; filaments filiform, nude ; anthers oblong. *Ovary* sessile, 5-angled, 5-chambered, with 2 basal ovules pendulous from an ascending funicle ; style subulate, 5-angled ; stigma simple. *Fruit* breaking up into five 1-seeded cocci. *Seed* erect, compressed, broadly oblong, mucilaginous ; cotyledons broad, flat ; endosperm horny.

Diffuse or prostrate branching herbs, woody at the base, pubescent, hispid or glabrous ; leaves opposite, 1-3-foliolate ; leaflets entire, mucronate ; stipules often spinescent ; flowers peduncled, solitary.

Species about 36, natives of the Mediterranean Region, western Asia, eastern India, Africa, and South America ; 1 species in South Africa, recorded from S.W. Africa and the Prieska district.

3964

2. SEETZENIA, R.Br.

Calyx 5-parted, with valvate æstivation. *Petals* 0. *Disc* small, 5-lobed. *Stamens* normally 5, sometimes 8, inserted on the disc ; filaments filiform, glabrous, naked ; anthers sub-globose. *Ovary* oblong-clavate, sessile, 5-angled, 5-chambered, with a single pendulous ovule in each chamber ; styles 5, rarely 6-7, free, spreading ; stigmas capitate. *Fruit* a capsule, breaking up into 5 cocci separating from a 5-angled axis. *Seeds* compressed ; cotyledons thick ; endosperm scanty.

A woolly or glabrous undershrub, with jointed branches ; leaves opposite, trifoliolate ; leaflets flat, apiculate, with the terminal leaflet obovate and larger ; stipules intrapetiole ; flowers solitary, peduncled ; peduncle pendulous in fruit.

Species 2 ; one in North Africa and India, the other in South Africa and recorded from the Clanwilliam and Van Rhynsdorp districts.

3965

3. ZYGOPHYLLUM, Linn.

Calyx 4-5-partite, persistent or deciduous, imbricate. *Petals* 4-5, clawed, imbricated and twisted. *Disc* fleshy, 8-10-angled. *Stamens* 8-10, inserted at the base of the disc; filaments filiform, with an entire bifid or 2-partite scale at the base; anthers oblong. *Ovary* sessile on the disc, 4-5-angled, 4-5- (rarely 2-3-) chambered, with 2 to many ovules in each chamber; style furrowed, continuous with the ovary; stigma minute. *Fruit* a 4-5-angled or -winged capsule, 5-6-locular, with few or several seeds. *Seeds* crustaceous; embryo with oblong cotyledons; endosperm scanty.

Small shrubs or undershrubs, often spiny; leaves opposite, 2-foliate, very rarely 1-foliate, often fleshy; stipules membranous or spinous; flowers solitary or 2-nate.

Species about 96, mostly African and Australian; 43 species in South Africa, mostly in the Karroo, but spreading to S.W. Africa and the Transvaal; not found further east than Port Alfred.

3967

4. AUGEA, Thunb.

Calyx obconic at the base, 5-fid; segments mucronate, with membranous margins, imbricate, persistent. *Petals* 5, 3-fid, opposite the outer stamens and inserted with them. *Disc* urceolate, membranous, toothed; teeth 10, lanceolate, acute. *Stamens* 10, inserted on the margin of the disc and alternating with the teeth; the outer shorter than the inner; filaments subulate, with membranous margins, deeply 3-fid at the apex, with the middle lobe bearing an anther; anthers dorsifixed, oblong, obtusely mucronate at the apex. *Ovary* sunk in the disc, sessile, 10-chambered, with 2-3-ovules in each chamber; style short; stigma small, sub-capitate. *Capsule* oblong, irregularly septicidal. *Seeds* obliquely ovate, flattened, with a thick testa; cotyledons flat, thick; endosperm 0.

An annual glabrous fleshy herb, with the aspect of a *Mesembrianthemum*; root fusiform; stem simple or divided at the base, jointed, with terete erect alternate branches; leaves opposite, simple, connate, sub-terete, obtuse or sub-acute; stipules short; flowers few, shortly pedicelled at the nodes of the branches.

Endemic; species 1, found in the Karroo.

3975

5. NEOLUEDERITZIA, Schinz

Plants dioecious. *Sepals* equal, lanceolate, persistent. *Petals* ?; segments ligulate, pilose. *Disc* hyaline, cucullate, surrounding the immature fruit. *Fruit* a capsule, plumose-hirsute, breaking up into 5 cocci. *Seeds* without endosperm.

A branched shrub; branches terete, with spines at the nodes; leaves fascicled at the nodes, imparipinnate; leaflets obovate or oblong-ovate; flowers peduncled and solitary between the fascicle of leaves.

Endemic; species 1, found in S.W. Africa.

3976

6. SISYNDITE, E.Mey.

Calyx 5-partite, with the lobes somewhat imbricating. *Petals* 5, obovate, a little longer than the calyx. *Disc* 5-lobed, its scales surrounding the ovary and opposite the sepals. *Stamens* 10; filaments subulate; anthers linear. *Ovary* sessile, hirsute, 5-angled, 5-chambered, with a solitary pendulous ovule in each chamber; style filiform, hairy; stigma clavate, 5-furrowed. *Fruit* a capsule, 5-lobed, ovate, acute, covered with long yellowish hairs, at length separating and opening by the ventral sutures. *Seeds* compressed; cotyledons thick; endosperm 0.

An undershrub with the aspect of *Cadaba juncea*, glabrous and glaucous; leaves approaching in pairs (opposite?), simple, obovate, sometimes leaves almost 0; stipules 2, short; flowers peduncled, solitary.

Endemic; species 1, found in Little Namaqualand and S.W. Africa.

3978

7. TRIBULUS, Tourn.

Calyx 5-partite, deciduous or persistent, imbricated. *Petals* 5, fugacious, spreading, imbricate. *Disc* annular, 10-lobed. *Stamens* 10, inserted at the base of the disc; the 5 opposite the calyx-lobes with a gland externally at the base; anthers cordate. *Ovary* sessile, adpressed hirsute, 5-12-lobed, 5-12-chambered, with 1-5 ovules in each chamber; style short or 0; stigmas 5-12. *Fruit* 5-angled, breaking up into 5-12 cocci which are winged spinous or tuberculate. *Seeds* solitary in each coccus, pendulous; cotyledons oval; endosperm 0.

Laxly branched prostrate herbs, often silky-pilose; leaves opposite, one usually much larger than the other, abruptly pinnate; stipules present; flowers peduncled, axillary, solitary.

Species about 22, found in all warm countries; 7 species in South Africa, widely spread.

3980

8. BALANITES, Delile.

Sepals 5, deciduous, with imbricate margins. *Petals* 5, oblong, glabrous or villous, imbricate. *Disc* thick, 10-furrowed. *Stamens* 10, inserted at the base of the disc; filaments nude. *Ovary* globose, semi-immersed in the top of the disc, villous, 5-chambered, with an apical pendulous ovule in each chamber; style short, terete or 5-furrowed; stigmas 1-5, simple, minute. *Fruit* a fleshy drupe, oily, 1-locular, 1-seeded. *Seed* pendulous; cotyledons thick; endosperm 0.

Spiny shrubs or trees; leaves alternate, 2-foliate; inflorescence an axillary cyme.

Species 17, mostly African, but also occur in the Malay Peninsula; 1 species found in the northern Transvaal.

91. RUTACEÆ.

Flowers bisexual or unisexual. *Sepals* 4-5, mostly imbricate, free or connate. *Petals* 4-5, rarely 0, hypogynous or perigynous, imbricate or rarely valvate. *Stamens* inserted at the base or rarely on the margin of a disc, equalling the number of petals or twice as many, very rarely fewer or many, some often reduced to staminodes, free or more rarely connate at the base or adnate to the petals; anthers 2-theous, usually glandular at the apex. *Disc* between the ovary and the stamens, very rarely absent, often annular or cushion-shaped, sometimes tubular or produced into a gynophore, often lining the bottom of the calyx. *Gynæcium* usually of 4-5 carpels, more or less free, very rarely more or fewer, or ovary superior, 4-5-chambered, rarely 1-chambered, with usually 2 ovules in each carpel or ovary chamber; styles distinct or connate, terminal, ventral or basal on the ovary. *Fruit* breaking up into 1-seeded cocci or more rarely a 1- or 4-5-locular drupe, rarely a capsule. *Seeds* oblong or reniform; embryo straight or curved; endosperm 0 or fleshy.

Trees or shrubs, very rarely herbs, glandular-punctate and strong-smelling; leaves opposite or alternate, simple or digitately 1-5-foliate or pinnate, gland-dotted; stipules 0; inflorescence a terminal or axillary umbel, head, spike, raceme, or panicle, or flowers solitary.

Genera about 115, with about 700 species, found in all warm and temperate regions, most numerous in South Africa and Australia.

SERIES A.—Ovary deeply 2-5-lobed, with the lobes divided and the style basal or ventral, or the stigmas somewhat connate; fruit a capsule, or of 3-5 cocci.

Tribe **Zanthoxyleæ**: Plants diœcious or monœcious, with occasional bisexual flowers; flowers regular; petals and stamens free, spreading; disc free, sometimes obsolete; ovules 2; carpels 2-5; embryo straight or curved; cotyledons very often flat (genus 1).

Tribe **Ruteæ**: Flowers regular, bisexual, often 4-merous; petals and stamens free, spreading; disc free, thick; ovules 3 or more; endosperm fleshy; embryo often curved; herbs, often woody at the base; leaves various, often pinnatisect (genus 2).

Tribe **Diosmeæ**: Flowers regular, often bisexual; petals free, often erect; stamens 4-5, often alternating with staminodes; disc free or attached to the calyx, sometimes obsolete; ovary 4-5-lobed, 4-5-chambered, rarely 1-chambered, with usually 2, rarely 4, ovules in each chamber; endosperm 0; embryo straight; cotyledons fleshy; mostly ericoid shrubs and strongly aromatic; leaves mostly small, opposite or alternate (genera 3-15).

SERIES B.—Ovary entire or slightly 2-5-lobed, or gynœcium of 2-4 more or less free carpels; style terminal; fruit a drupe or berry.

Tribe **Toddaliæ**: Plants diœcious, with occasional bisexual flowers; flowers regular; petals and stamens free, often spreading; disc free; ovules 2; endosperm often present; cotyledons flat, rarely almond-shaped (genera 16-19).

Tribe **Aurantieæ**: Flowers regular, bisexual; petals and stamens free or connate; ovules 1-2 or more; fruit often pulpy; endosperm 0; leaves 1-3-foliate or pinnate (genus 20).

1. Leaves compound, pinnate or 3-foliate 2
Leaves simple 9
2. An aromatic herb; stamens 10 2. *Ruta*, *Linn.*
Trees or large shrubs, not aromatic; stamens 4 or 5 3
3. Leaves pinnate 4
Leaves 3-foliate 5
4. Small trees with spiny branches; stamens 4; ovary 1-chambered;
flowers unisexual 1. *Fagara*, *Linn.*
Unarmed trees or shrubs; stamens 8; ovary 4-5-chambered;
flowers bisexual 20. *Clausena*, *Burm.*
5. Small aromatic shrubs; fruit a 2-locular didymous capsule
3. *Thamnosma*, *Torr. & Frem.*
Large shrubs or trees, not aromatic; fruit a drupe 6
6. Stamens twice as many as the petals 17. *Vepris*, *Comm.*
Stamens as many as the petals 7
7. Gynœcium of a single carpel, or carpels united 8
Gynœcium of 2-4 more or less free carpels; carpels becoming quite
free in the fruit, often 1-3 aborting but evident 16. *Oricia*, *Pierre*
8. Scrambling plants; branches armed with prickles; ovary
4-7-chambered 18. *Toddalia*, *Juss.*
Trees or shrubs; branches unarmed; ovary 1-2-chambered
19. *Teclea*, *Delile*
9. Sepals and petals 4; stamens 4-8 10
Sepals and petals 5, rarely petals 0; stamens 5, fertile, often with
5 staminodes 12
10. Flowers bisexual; fruit a 2-locular didymous capsule, with 4-6
seeds in each loculus 3. *Thamnosma*, *Torr. & Frem.*
Flowers unisexual; fruit linear-oblong or lanceolate, tipped with
the persistent style, or produced into a straight beak 11
11. Petals 4; leaves needle-like, eglandular 14. *Empleuridium*, *Sond.*
Petals 0; leaves linear-lanceolate, glandular 15. *Empleurum*, *Soland.*
12. Fertile stamens 5; staminodes 0 13
Fertile stamens 5, alternating with 5 staminodes 16
13. Disc completely enclosing the ovary and perforated by the style
13. *Macrostylis*, *B. & W.*
Ovary seated at the bottom of the disc, but not completely enveloped
by it 14

14. Ovary villous ; petals clawed, hispid at the base . . . **11. Phyllosma**, *Bolus*
 Ovary glabrous ; petals sessile or clawed, naked or transversely
 bearded within 15
15. Petals sessile, naked **10. Diosma**, *Linn.*
 Petals clawed, transversely bearded **12. Euchaetis**, *B. & W.*
16. A large tree ; leaves large, petioled, opposite ; flowers in large
 terminal panicles **4. Calodendron**, *Thunb.*
 Aromatic shrubs or undershrubs ; leaves small, alternate or
 opposite ; flowers not paniced 17
17. Staminodes adnate to or hidden in the channelled claw of the petals
 **8. Coleonema**, *B. & W.*
 Staminodes free from the petals, rarely adnate to the petals, but if so
 then claw of petals not deeply longitudinally channelled 18
18. Style short ; stigma capitate 19
 Style as long as the petals ; stigma simple (not capitate) 20
19. Petals with very short claws, naked within ; anthers tipped with a
 stalked gland **7. Adenandra**, *Willd.*
 Petals with bearded claws, very rarely beardless, but then anthers
 tipped with a sessile gland **9. Acmadenia**, *B. & W.*
20. Ovary 5-lobed **5. Barosma**, *Willd.*
 Ovary usually 3-lobed, more rarely 2-4-lobed **6. Agathosma**, *Willd.*

3991

1. FAGARA, Linn.

(Under *Zanthoxylum*, Linn. and *Xanthoxylum*, Linn.)

Plants monœcious or diœcious. *Sepals* 4, usually ciliate. *Petals* 4, free. *Male-flowers* : *Stamens* 4 ; filaments linear ; anthers globose. *Ovary* rudimentary. *Female flowers* : *Staminodes* rudimentary. *Ovary* glandular, 1-chambered, with 2 ovules ; style simple ; stigma capitate. *Fruit* a globose glandular capsule. *Seeds* black, shining.

Small trees, with spiny branches ; leaves alternate, pinnate ; leaflets 3-9-jugate ; inflorescence a panicle.

Species about 140, widely dispersed in tropical countries ; 3 species in South Africa, extending from the Transvaal, Swaziland, and Natal through the eastern districts to Uitenhage ; also recorded from the Somerset East, Bedford and Queenstown districts.

4012

2. RUTA, Linn.

Calyx 4-5-lobed or -partite, persistent. *Petals* 4-5, with the limb often toothed or ciliate, imbricate. *Receptacle* thick, urceolate, with 8-10 glands or pits. *Stamens* 8-10, inserted at the base of the receptacle ; the alternate shorter ; filaments dilated at the base. *Ovary* sessile, deeply 4-5-lobed, 4-5-chambered, with axile ovules ; style simple ; stigma simple. *Fruit* a 4-5-lobed capsule, with the lobes indehiscent or dehiscent at the apex, many-seeded. *Seeds* angled, deeply punctate ; embryo slightly curved ; endosperm fleshy.

Herbs or undershrubs, glandular-punctate, scented ; leaves alternate, simple, 3-foliate, or pinnatisect ; flowers in terminal corymbs or panicles ; bracts present.

Species about 53, natives of the Mediterranean Region and western Asia ; 1 species naturalised in South Africa.

4014

3. THAMNOSMA, Torr. & Frem.

Calyx 4-lobed. *Petals* 4, sessile, entire, imbricate. *Disc* cupular, crenate or lobed. *Stamens* 8, inserted at the base of the disc ; filaments filiform ; anthers short. *Ovary* long or shortly stalked, didymous, 2-chambered, with 5-6 axile ovules in each chamber ; style simple ; stigma capitate.

Fruit a leathery 2-locular didymous capsule, with 4-6 seeds in each loculus. *Seeds* sub-reniform, smooth or muricated; embryo curved; endosperm fleshy.

Shrubs, or herbs shrubby at the base, leafy or almost leafless, gland-dotted, strong-smelling; leaves alternate, simple (rarely 3-foliate), linear or cuneate, entire; flowers pedicelled in sub-racemes at the apex of the branches.

Species 5, 2 of which are natives of South America; 1 species found in Arabia, and 2 in South-West Africa and in the Transvaal.

4035

4. CALODENDRON, Thunb.

Calyx 5-partite, valvate. *Petals* 5, elongate, spreading or reflexed, imbricate. *Disc* minute, cupular. *Stamens* 10; ♂9 fertile, adnate to the outside of the disc, equalling the petals; 5 reduced to petaloid staminodes; filaments filiform, glabrous; anthers glandular at the apex. *Ovary* stalked, oblong, 5-lobed, 5-chambered, with the lobes tuberculate and with stipitate glands at the apex, with 2 ovules in each chamber; style simple; stigma minute. *Fruit* a woody sub-globose 5-angled capsule; valves covered with blunt protuberances. *Seeds* 2, large, black, shining; cotyledons fleshy.

A large tree; leaves opposite, petioled, large, simple, gland-dotted; inflorescence a large terminal paniced raceme.

Endemic; species 1, found from Swellendam to Natal and the Transvaal.

4036

5. BAROSMA, Willd.

Flowers usually bisexual, or occasionally with unisexual flowers on the same plant. *Calyx* 5-fid or 5-parted. *Petals* 5, much longer than the calyx, spreading, shortly clawed, with the claw glabrous, imbricate. *Disc* cupular, with an entire or lobed margin. *Stamens* 5, inserted on the outer margin of the disc; staminodes 5, shorter than stamens, petaloid or filiform, glandular at the apex; filaments glabrous or pilose; anthers ovoid, blunt or with a small apical gland. *Ovary* deeply 5-lobed, with the lobes eared at the apex, often glandular-tuberculate; style central, longer than the stamens, glabrous or pilose at the base; stigma minute. *Fruit* of 5 cocci, beaked, compressed, glandular-punctate.

Small erect shrubs; leaves opposite, rarely alternate, flat or with revolute margins, with the margins entire or glandular-crenate; flowers axillary, solitary, 3-nate, or in a sub-corymbose inflorescence; bracts often present; bracteoles present.

Endemic; species 20, mostly found in the south-western districts, but 1 species reaches Natal.

4037

6. AGATHOSMA, Willd.

Calyx unequal or sub-equal, 5-partite. *Petals* 5, narrow, clawed, with the claw often pilose or hispid, imbricate. *Disc* cupular, with a crenate or lobed margin. *Stamens* 5, inserted on the outer margin of the disc, often much longer than the calyx; staminodes 5, often short and petal-like, sometimes resembling the petals, sometimes adnate to the claw of the petal; filaments filiform-subulate, glabrous; anthers sub-globose, with a minute apical gland. *Ovary* 2-4-lobed, immersed in the disc; style filiform, glabrous; stigma simple. *Fruit* very often of 3 cocci, compressed, horned.

Erect shrubs; leaves alternate, rarely opposite, flat or sub-3-angled, entire or glandular-toothed; inflorescence an umbel or head at the apex of the branches, very rarely axillary; bracteoles 2.

Endemic; described species 143, mainly massed in the south-western districts with the eastern limits in the Albany district.

4038

7. ADENANDRA, Willd.

Calyx 5-partite, glandular-punctate. *Petals* 5, naked, with very short claws, imbricated. *Disc* cupular, thick, 5-10-lobed. *Stamens* 5, shorter than the calyx, inserted on the outer margin of the disc, alternating with 5 staminodes, each tipped with a concave or globose gland; filaments subulate, glabrous or pilose; anthers oblong, with a stalked spoon-shaped rarely globose gland at the apex. *Ovary* immersed in the disc, 5-lobed, 5-chambered, covered with stalked glands, with 2 ovules in each chamber; style short, simple; stigma discoid, 5-lobed. *Fruit* breaking up into separate cocci, equalling or exceeding the calyx, obtuse or horned, glandular-muricate.

Small virgate or much-branched shrubs; leaves alternate, rarely opposite, small, entire, gland-dotted, often with 2 glands at the base of the petiole; flowers terminal, solitary, or inflorescence a sub-umbellate raceme.

Endemic; species 29, all of the south-western districts; 1 species reaches Riversdale.

4039

8. COLEONEMA, Bartl. & Wendl.

Calyx 5-partite. *Petals* 5, twice as long as the calyx, narrowed into a longitudinally channelled claw, imbricate. *Disc* cupular or 5-lobed, with the lobes 2-fid. *Stamens* 5, inserted on the outer margin of the disc, alternating with staminodes, adnate to or hidden in the channels of the petal-claws; filaments subulate; anthers oblong, glandular at the apex. *Gynæcium* of 5 carpels, nude or glandular at the apex, 5-chambered, with 2 ovules in each chamber; style simple; stigma capitate, 5-lobed. *Fruit* of 5 compressed rough cocci, horned at the apex.

Ericoid shrubs; leaves alternate, linear, gland-dotted; flowers very shortly pedicelled, solitary or few at the apices of the branches; bracts and bracteoles present.

Endemic; species 6, typically south-western, but extending eastwards to the Uitenhage district.

4040

9. ACMADENIA, Bartl. & Wendl.

Calyx 5-partite. *Petals* 5, clawed, with the claws bearded within (naked in 1 species). *Disc* cupular, with an entire or 5-lobed margin. *Stamens* 5, inserted on the outer margin of the disc, alternating with 5 small rudimentary staminodes; filaments subulate; anthers oblong, blunt, or with an erect sessile conical gland at the apex. *Ovary* 4-5-lobed, immersed at the bottom of the disc, glandular, glabrescent, or pilose, with 2 ovules in each chamber; style simple; stigma capitate, 5-lobed. *Fruit* breaking up into 5 cocci, transversely rugose, horned.

Ericoid shrubs; leaves opposite or alternate, simple, gland-dotted; flowers solitary, rarely 2-3-nate or crowded, surrounded by the upper leaves; bracts present.

Endemic; species 26, mainly in the south-western districts, but recorded as far east as Kaffraria.

4041

10. DIOSMA, Linn.

Calyx 5-partite. *Petals* 5, longer than the calyx, sessile, naked, imbricated. *Disc* fleshy, cup-like, 5-lobed. *Stamens* 5, inserted on the outer margin of the disc, much shorter than the petals; staminodes 0; filaments subulate; anthers oblong, glandular at the apex. *Ovary* inserted at the bottom of the disc, 5-lobed, 5-chambered, with 2 ovules in each chamber, glabrous; style simple; stigma capitate. *Fruit* of 5 cocci, transversely rugose, horned. *Seeds* solitary.

Ericoid shrubs ; leaves alternate or opposite, simple, linear, gland-dotted ; flowers shortly pedicelled, solitary or fascicled at the ends of the branches ; bracteoles 2.

Endemic ; species 15, mainly south-western, but extend a little to the east of Albany.

4402

11. PHYLLOSMMA, Bolus

Calyx 5-partite ; segments equal, erect, imbricate. *Petals* 5, spatulate, clawed, much longer than the calyx, hispid at the base. *Disc* fleshy, annular, with 5 deeply partite sub-cucullate segments, thick, acute or emarginate, sub-equaling the ovary. *Stamens* inserted on the outer margin of the disc ; filaments filiform, hispid ; anthers broadly elliptic, gland-tipped. *Ovary* 5-lobed, 5-chambered, with 2 ovules in each chamber, villous ; style simple, hispid ; stigma small. *Fruit* unknown.

An erect branched pubescent undershrub ; leaves scattered or the upper sub-opposite, linear-oblong, gland-dotted beneath, with revolute and thickened margins ; flowers very shortly pedicelled, terminal, solitary or often fascicled ; bracteoles 2.

Endemic ; species 1, recorded only from the Clanwilliam district.

4403

12. EUCHAETIS, Bartl. & Wendl.

Calyx 5-partite, with lanceolate imbricate segments. *Petals* 5, clawed, a little longer than the calyx, transversely bearded within. *Disc* fleshy, cup-like, 5-lobed. *Stamens* 5, inserted on the outer margin of the disc ; staminodes 0 ; filaments subulate ; anthers oblong, gland-tipped. *Ovary* immersed at the bottom of the disc, 5-lobed, 5-chambered, with 2 ovules in each chamber ; style simple ; stigma capitate. *Fruit* of 5 cocci, transversely rugose, horned.

Ericoid shrubs ; leaves opposite, rarely alternate, 3-angled or keeled ; flowers very shortly pedicelled, sub-solitary or in heads at the apex of the branches ; bracteoles 2.

Endemic ; species 12, mainly south-western, but extending into the Riversdale district.

4404

13. MACROSTYLIS, Bartl. & Wendl.

Calyx 5-parted. *Petals* 5, spatulate, clawed, bearded in the middle. *Disc* cup-shaped, with the mouth contracted, enclosing the ovary. *Stamens* 5, inserted on the outside at the base of the disc ; staminodes 0 ; filaments filiform ; anthers oblong, gland-tipped. *Ovary* 3-lobed, 3-chambered, with 2 ovules in each chamber ; style basal, simple, elongated ; stigma simple or capitate. *Fruit* of 3 horned cocci.

Sub-erect or depressed shrublets ; leaves small, alternate and opposite, flat or 3-angled, gland-dotted ; inflorescence a sub-umbel or head at the ends of the branches ; peduncles short ; bracts present.

Endemic ; species 10, found in the south-western districts and in the Uitenhage district.

4405

14. EMPLEURIDIUM, Sond.

Plants dioecious. *Calyx* 4-partite. *Petals* 4, sessile, deciduous. *Male flowers* : *Disc* widened, sub-quadrate, angled. *Stamens* 4, inserted at the angles of the disc beneath the margin ; staminodes 0 ; filaments short, subulate ; anthers didymous. *Style* inserted in the middle of the disc, short. *Female flowers* unknown. *Fruit* linear-oblong, 1-locular, tipped with the persistent style.

Small undershrub ; leaves scattered, spreading, needle-like, eglandular ; flowers minute, axillary, solitary, pedicelled ; bracteoles 2

Endemic ; species 1, found in the Caledon district.

4046

15. EMPLEURUM, Soland.

Plants monoecious. *Calyx* cupular, 4-fid. *Petals* 0. *Disc* 0. *Male flowers*: *Stamens* 4, opposite the calyx-lobes; filaments short; anthers large, with the thecæ diverging at the apex and tipped with a sessile gland. *Ovary* rudimentary. *Female flowers*: *Gynæcium* of 1 (rarely 2) carpels, sessile, compressed, long-beaked; style lateral, inflexed; stigma simple. *Fruit* lanceolate, compressed, produced into a straight beak.

An erect shrub; leaves alternate, linear-lanceolate, crenulate, gland-dotted; flowers small, axillary, solitary or 2-3, with short peduncles; bracteoles present.

Endemic; species 2, extending from the south-western districts to the Uitenhage district.

4070

16. ORICIA, Pierre

Flowers unisexual, with occasional bisexual flowers. *Calyx* 4-lobed. *Petals* 4, much longer than the calyx. *Stamens* 4, or in the female flowers represented by 4 staminodes. *Gynæcium* of 2-4 carpels, somewhat cohering at the base, otherwise free; carpels with 2 ovules in each ovary, hispid; styles very short, sometimes cohering and ending in a fused obscurely 2-4-lobed peltate stigma. *Fruit* of 2-4 distinct carpels, 1-3 of which often abort but persist. *Seed* solitary in each carpel, without endosperm.

Trees; leaves digitately 3-5-foliolate, often very large, and in some species the leaves subtending the inflorescence very much reduced; leaflets gland-dotted; inflorescence an axillary and terminal raceme or panicle; peduncles flattened, tomentose.

Species 6, all African; 2 species in South Africa, recorded from the northern Transvaal and Kentani.

4076

17. VEPRIS, Comm.

Flowers unisexual. *Calyx* cup-shaped, 4-lobed, very rarely 2-lobed. *Petals* 4 (in an Indian species 2), much longer than the calyx. *Male flowers*: *Stamens* 8 (in an Indian species 4), usually 4 long and 4 short. *Ovary* rudimentary, 2-4-angled or with 2-4-styles. *Female flowers*: *Staminodes* 8. *Ovary* 2-4-chambered. *Fruit* 2-4-locular, sometimes 1 loculus only developing; loculi 1-seeded. *Seeds* with endosperm.

Unarmed shrubs or trees; leaves digitately 1-3- (rarely 2-4-) foliate, gland-dotted; inflorescence a terminal and axillary cyme, panicle, or raceme.

Species about 10, widely distributed through Africa and the Mascarene Islands, also found in India; 2 species in South Africa, recorded from the Transvaal, Natal, and the Knysna district.

4077

18. TODDALIA, Juss.

Flowers unisexual. *Calyx* short, cup-like, 5-toothed. *Petals* 5, much longer than the calyx. *Male flowers*: *Stamens* as many as the petals. *Ovary* rudimentary, seated on the gynophore. *Female flowers*: *Staminodes* very short. *Ovary* shortly stalked, 5-7-chambered, with 2 ovules in each chamber; stigma sub-sessile. *Fruit* a fleshy drupe, about the size of a pea (resembling a miniature orange), 3-7-locular. *Seeds* solitary in each loculus.

Woody scramblers; branches usually armed with prickles, glabrous or rusty pubescent; leaves 3-foliolate; leaflets slightly crenulate at the margins, gland-dotted; inflorescence an axillary and terminal panicle, rusty-pubescent.

Species 1, found in all tropical and sub-tropical countries; recorded from the Transvaal.

4085

19. TECLEA, Delile

Flowers unisexual, with occasional bisexual flowers. *Calyx* cup-shaped, 4-5-lobed, rarely 3-lobed. *Petals* 4-5. *Male flowers*: *Stamens* as many as the petals. *Ovary* small, rudimentary, with a single style. *Female flowers*: *Staminodes* as many as the petals. *Ovary* globose, 1-chambered, with 2 ovules; stigma broad, peltate. *Fruit* fleshy, 1-locular, 1-seeded.

Unarmed shrubs or trees; leaves 1-3-foliate, gland-dotted; inflorescence a terminal or axillary panicle, raceme, cyme, or spike.

Species about 30, all African; 2 species in South Africa, recorded from Natal and the eastern districts to the Bathurst district.

4091

20. CLAUSENA, Burm.

(Myaris, Presl)

Calyx 4-5-lobed or -partite. *Petals* 4-5, free, imbricate. *Stamens* 8-10, free; the alternate a little smaller; filaments dilated at or below the middle; anthers short. *Disc* stalk-like. *Ovary* stalked, 4-5- (rarely 2-3-) chambered, with 2 ovules in each chamber; style often distinct, at length deciduous; stigma obtuse, entire or 2-5-lobed. *Fruit* fleshy, ovoid, oblong, or globose, 2-5-chambered, sometimes with 1 or more of the loculi abortive. *Seeds* oblong.

Unarmed trees or shrubs; leaves impari-pinnate, deciduous; leaflets entire or crenulate; inflorescence a terminal or axillary panicle or lax raceme.

Species about 15, natives of Africa and the Indo-Malayan Region; 1 species in South Africa, extending from the Transvaal, Natal, and the eastern districts to the Bathurst district.

92. SIMARUBACEÆ.

Plants sometimes monœcious. *Flowers* unisexual, or bisexual with occasional unisexual flowers on the same plant, rarely all bisexual, regular. *Calyx* 3-5-fid or -partite, or sepals free. *Petals* as many as the sepals, very rarely 0, imbricate or valvate. *Disc* annular, cup-like or produced into an elongated gynophore, entire or lobed, rarely 0. *Stamens* as many, or twice or three times as many as the petals, inserted on the base of the disc; filaments free, naked, pilose, or with an adnate scale at the base; anthers oblong, 2-theous, usually opening inwards by longitudinal slits. *Ovary* superior, very often 2-5-lobed, rarely entire, 1-5-chambered, or gynœcium of 3-5 free carpels, with the ovules usually solitary or sometimes in pairs; styles free, or connate, or simple and terminal in the undivided ovaries. *Fruit* dry or fleshy, indehiscent, very rarely dehiscent, sometimes winged. *Seeds* very often solitary, pendulous; embryo straight or curved; endosperm copious, scanty, or 0.

Shrubs or trees, usually characterised by a bitter principle; leaves alternate, rarely opposite, pinnate, rarely 1-3-foliate or simple; leaflets very rarely glandular; stipules 0; inflorescence mostly an axillary panicle or raceme, rarely a spike or cymose-corymb, or flowers solitary.

Genera 30, with over 100 species, found in all tropical and warm countries.

4128

1. KIRKIA, Oliv.

Flowers bisexual, or occasionally with unisexual flowers on the same plant. *Calyx* 4-partite. *Petals* 4, free, much exceeding the calyx. *Disc* fleshy, 4-angled. *Stamens* 4, alternating with the petals, inserted round the disc;

filaments filiform, without appendages; anthers ovate-oblong. *Ovary* very small, deeply 4-lobed, 4-chambered, with a solitary ovule (or 2?) in each chamber; styles distinct, very short; stigmas simple. *Fruit* dry, oblong, at length separating into 4 linear-oblong glabrous 1-seeded cocci. *Seeds* without endosperm.

Trees; leaves usually clustered at the ends of the branches, entire, pinnate, with many leaflets; flowers in numerous pedunculate cymose corymbs from the axils of the upper leaves.

An African genus of 7 species; 2 species occur in the Transvaal.

93. BURSERACEÆ.

Flowers bisexual, or with occasional unisexual flowers on the same plant. *Calyx* 3-5-fid or -partite, imbricate or valvate. *Petals* 3-5, rarely 0, erect or spreading, free or very rarely connate, deciduous, imbricate or valvate. *Disc* annular or cup-like, rarely inconspicuous, free or adnate to the calyx-tube. *Stamens* as many as or twice as many as the petals, inserted at the base of the disc, equal or unequal, or the alternate longer; filaments free; anthers sub-globose or oblong, 2-theous. *Ovary* superior, 2-5-chambered, 3-angled, ovoid or globose, with 2, very rarely 1, ovules in each chamber; style short; stigma simple or 2-5-lobed. *Fruit* drupaceous or capsular. *Seeds* pendulous; endosperm 0.

Trees or shrubs, balsamiferous or containing oil; leaves alternate, very rarely opposite, 3-foliolate or imparipinnate, very rarely 1-foliolate; stipules 0; flowers often small; inflorescence a raceme or panicle.

Genera 19, species about 150, found in all tropical countries.

4151

1. COMMIPHORA, Jacq.

(*Balsamodendron*, Kunth)

Flowers bisexual and unisexual on the same plant. *Calyx* urceolate or tubular, 4-toothed, persistent. *Petals* 4, erect or with recurved tips, valvate or with the sides imbricate and the tips incurved in æstivation. *Disc* erect, cupular. *Stamens* 8, inserted on the margin of the disc, erect, free, with the alternate shorter. *Ovary* sessile, surrounded by the disc, 2-3-chambered, with 2 ovules in each chamber; style short; stigma obtusely 4-lobed. *Fruit* an ovoid or globose drupe, 1-seeded.

Trees or shrubs, balsamiferous, often spinous; leaves alternate, 1-3-foliolate or imparipinnate, few-jugate; leaflets crenate or serrate; flowers small, shortly pedicelled, fascicled on thickened nodes, or on short lateral branchlets, or on 1-4-flowered axillary jointed peduncles.

Species about 140, mostly African, also found in Madagascar and eastern India; 28 species (probably more) in South Africa, found in the Transvaal, Natal, and the eastern districts to East London and Kingwilliamstown; also in the northern and north-western districts, Namaqualand, and S.W. Africa.

94. MELIACEÆ.

Plants sometimes diœcious, with occasional bisexual flowers. *Flowers* regular, usually bisexual, sometimes unisexual. *Calyx* 4-5-fid or -partite, imbricate, very rarely valvate. *Petals* 4-5, rarely 3-7, free, contorted or imbricate. *Disc* various, rarely absent. *Stamens* usually 8-10, more rarely 4, very rarely 12-20; filaments free or united to form a short or long tube, with the tube entire, toothed, or variously cut above; anthers 2-theous,

opening by longitudinal slits. *Ovary* superior, usually 2-5-chambered, more rarely 6- 10- or 12-chambered, with 1, 2, or many ovules in each chamber; style simple, short or elongated; stigma discoid or capitate, sometimes more or less distinctly lobed. *Fruit* a capsule, drupe, or berry. *Seeds* solitary or 2 or more in each loculus, sometimes winged, sometimes with an arillus; embryo sometimes curved; endosperm present or absent.

Trees or shrubs, very rarely sub-herbaceous; leaves alternate, rarely sub-opposite, simple or 3 to many-pinnate, often crowded at the apices of the branches, sometimes fascicled; stipules 0; inflorescence usually a panicle, more rarely flowers solitary or fascicled.

Genera 46; species about 750 or 800; natives of most warm countries; frequent in America and Asia, less frequent in Africa.

Tribe **Cedreleæ**: Stamens free, inserted outside the base of the disc; ovary with many ovules in each chamber; capsule with the valves breaking away from the dissepiments, or loculicidally 3-5-valved, with the valves free from the axis; seeds many, compressed; leaves often pinnate (genus 1).

Tribe **Pteroxyloæ**: Stamens free, inserted at the base of the disc; ovary with a solitary ascending ovule in each chamber; fruit capsular, with the valves attached to the axis; seeds compressed; leaves pinnate (genus 2).

Tribe **Swietenieæ**: Stamens united to form a tube; ovary with many ovules in each chamber; capsule with the valves breaking away from the dissepiments from the apex, very often free from the 3-5-winged axis; seeds many, very often winged; endosperm present or 0; leaves pinnate (genus 3).

Tribe **Turraeæ**: Stamens connate into a long or short tube; ovary with 2 ovules in each chamber; capsule 5 to many-locular; endosperm present or none; leaves simple (genera 4-5).

Tribe **Meliæ**: Stamens connate into a tube; ovary with 2 ovules in each chamber; fruit a drupe; endosperm sometimes 0; leaves pinnate (genus 6).

Tribe **Trichilieæ**: Stamens connate or more or less free; ovary with 2 ovules in each chamber; fruit a dry berry or a 2-4-valved capsule; leaves pinnate (genera 7-8).

- | | |
|--|---------------------------------|
| 1. Leaves simple | 2 |
| Leaves 3-foliolate or pinnate | 3 |
| 2. Disc cup-shaped; stamens 8, with the filaments connate at the base;
fruit inflated | 4. <i>Nymania</i> , Lindl. |
| Disc 0; stamens 10, with the filaments connate into a long cylindric
tube; fruit not inflated | 5. <i>Turraea</i> , Linn. |
| 3. Filaments free | 4 |
| Filaments connate at the base or into a cylindric tube, very rarely
free, but then 2 ovules in each ovary-chamber | 5 |
| 4. Sepals and petals 5; ovary 5-chambered, with 8-12 pendulous
ovules in each chamber | 1. <i>Cedrela</i> , Linn. |
| Sepals and petals 4; ovary 2-chambered, with a single ascending
ovule in each chamber | 2. <i>Pteroxylon</i> , E. & Z. |
| 5. Ovary with several ovules in each chamber | 3. <i>Pseudocedrela</i> , Harms |
| Ovary with 2 ovules in each chamber | 6 |
| 6. Leaves bipinnate | 6. <i>Melia</i> , Linn. |
| Leaves pinnate or 3-foliolate | 7 |
| 7. Filaments connate to the apex; tube toothed; fruit a berry | 7. <i>Ekebergia</i> , Sparrm. |
| Filaments not connate to the apex, with a lateral tooth on each
side of the anther; fruit a capsule | 8. <i>Trichilia</i> , Linn. |

4155

1. CEDRELA, Linn.

Calyx short, 5-parted, sometimes split. *Petals* 5, free, imbricated. *Disc* thick or raised, 4-6-lobed. *Stamens* 4-6, free, inserted on top of the disc; filaments subulate; anthers widely oblong, versatile; staminodes sometimes alternating with the stamens. *Ovary* sessile on top of the disc, 5-chambered, with 8-12 pendulous ovules in each chamber; style filiform; stigma discoid. *Fruit* a coriaceous or membranous capsule, opening by

5 valves and leaving the dissepiments attached to the persistent axis. *Seeds* flattened, winged; cotyledons flat, sub-foliaceous; endosperm scanty.

Tall trees, with coloured wood; leaves pinnate; leaflets numerous, opposite or sub-opposite, entire or serrated; inflorescence a terminal or sub-terminal panicle.

Species 33, natives of tropical Asia and America; 1 species found in Australia and cultivated in South Africa.

4157

2. PTAEROXYLON, E. & Z.

Plants dicecious, with occasional bisexual flowers. *Calyx* small, 4-parted, imbricate. *Petals* 4, at first erect, at length recurved, imbricate. *Disc* fleshy, obscurely 5-lobed. *Stamens* 4, inserted at the base of the disc, alternating with the petals. *Ovary* inserted on the disc, compressed, obcordate, 2-chambered, with a solitary ascending ovule in each chamber; styles 2, free or connate; stigmas capitate. *Fruit* a compressed capsule, bilobed at the apex, cordate at the base, 2-locular, 2-seeded, with the loculi internally dehiscing, at length separating and suspended from a bipartite axis. *Seeds* compressed, winged; embryo curved; endosperm 0.

A large tree; leaves alternate or sub-opposite, pinnate; leaflets opposite, with unequal sides; flowers small; inflorescence a panicle, with the panicles axillary, solitary or fascicled, shorter than the leaves.

Endemic; species 1, extending from the Transvaal and Natal, through the eastern districts to the Uitenhage district.

4161

3. PSEUDOCEDRELA, Harms

Sepals 4-5, connate at the base. *Petals* 4-5, free, shortly clawed, 4 times or more longer than the calyx. *Disc* fleshy, cupular, surrounding the base of the ovary. *Stamens* 10; filaments connate into an urceolate tube about half the length of the petals and sometimes cut into 10 segments almost to the middle, with each segment 2-toothed at the apex; anthers oval. *Ovary* small, sub-globose, 5-chambered, with several pendulous ovules in 2 rows; style cylindric; stigma disciform. *Fruit* a capsule, almost 5-valved to the base, with the valves joined after dehiscence to a 5-winged or 5-angled column. *Seeds* 5 in each loculus, winged; cotyledons broadly obovate; endosperm almost absent.

A tall tree; leaves crowded at the apex of the branchlets, pinnate; pinnae 3-9-jugate, unequal sided, sub-falcate, sub-truncate at the base; inflorescence an axillary panicle.

Species 1, found in tropical Africa. Its occurrence in South Africa is somewhat uncertain.

4168

4. NYMANIA, Lindb.

(Aitonía, Thunb.)

Calyx short, deeply 4-parted, deciduous. *Petals* 4, much longer than the calyx, sessile, strongly imbricated and slightly convolute in æstivation. *Disc* cup-shaped, crenulate, fleshy. *Stamens* 8, inserted at the base of the disc, exerted; filaments connate at the base; anthers oblong. *Ovary* sessile, 4-lobed, 4-chambered, with 2 collateral axile ascending ovules in each chamber; style filiform, exerted; stigma simple. *Fruit* an inflated membranous capsule, deeply 4-lobed, 4-angled, 4-locular. *Seeds* 1-2 in each loculus, reniform, corrugated; embryo enclosed in a membranous skin separable from the testa; endosperm 0.

A shrub; leaves alternate or fascicled, entire; flowers axillary, solitary, pedicelled.

Endemic; species 1, typically of the Karroo, but extends to Namaqualand and to the Uitenhage district.

4171

5. *TURRAEA*, Linn.

Calyx 4-5-toothed or -partite. *Petals* 4-5, free, strap-shaped, convolute in æstivation. *Disc* 0. *Stamens* 10; filaments connate into a long cylindric tube, 10-toothed at the summit; anthers inserted between the teeth of the staminal-tube. *Ovary* sessile, 5-10-20-chambered, with 2 superposed ovules in each chamber; style filiform, thickened at the apex; stigma discoid or capitate. *Fruit* a 5- or many-locular capsule, each loculus 1-2-seeded. *Seeds* oblong, curved, sometimes with winged margins; embryo curved; endosperm fleshy.

Trees or shrubs; leaves alternate, petioled, entire or obtusely lobed; flowers elongated, axillary, solitary or fascicled; bracts many.

Species about 77, found in tropical and sub-tropical countries, especially abundant in Africa, Madagascar, and the Mascarene Islands; 5 species in South Africa, extending from the Transvaal and Natal, through the eastern districts to the Bathurst district.

4175

6. *MELIA*, Linn.

Calyx short, 5-6-lobed, imbricated. *Petals* 5-6; free, spatulate-oblong, spreading, imbricated in bud. *Disc* annular. *Stamens* 10-12; filaments connated into a cylindric tube, dilated at the base and apex and 10-12-striate and -toothed; anthers included or partly exserted. *Ovary* 3-6-chambered, with 2 superposed ovules in each chamber; style slender, nearly as long as the staminal-tube; stigma capitate. *Fruit* a drupe. *Seeds* pendulous; cotyledons foliaceous; endosperm fleshy, scanty, or 0.

Trees; leaves alternate, pinnate, or bipinnate, or with 2-3-leaflets; leaflets entire or toothed; inflorescence an ample axillary panicle; pubescence, when present, often stellate-mealy.

Species about 12, natives of tropical and sub-tropical regions; 1 species cultivated in South Africa.

4193

7. *EKEBERGIA*, Sparrm.

Plants dicæious, with occasional bisexual flowers. *Calyx* short, 4-5-fid, imbricated. *Petals* 4-5, elliptic or oblong, imbricated. *Disc* annular, free or united to the base of the ovary. *Stamens* 8-10; filaments connate in a short 10-toothed tube; anthers on the teeth of the staminal-tube. *Ovary* sessile, 4-5-chambered, with 2 pendulous superposed ovules in each chamber; style very short; stigma clavate or discoid, obscurely 4-5-lobed. *Fruit* a dry globose 4-5-locular 5-seeded berry, sometimes, by abortion, with 1-2 seeds only. *Seeds* without an appendage; cotyledons fleshy; endosperm 0.

Trees; leaves alternate, pinnate; leaflets opposite; inflorescence an axillary panicle.

An African genus of 16 species; 3 species in South Africa, extending from the northern Transvaal and Natal through the eastern districts to the George district.

4195

8. TRICHILIA, Linn.

Calyx short, 4-5-toothed or -cleft. *Petals* 4-5, oblong or ovate, erect or spreading, imbricated. *Disc* annular, free or adnate to the ovary or to the base of the staminal-tube. *Stamens* 8-10; filaments connate into a tube or more or less free, when connate the tube entire (?) or with a lateral tooth on each side of the anther; anthers erect, blunt, exserted. *Ovary* immersed in the disc, 2-4-chambered, with 2 collateral or superposed ovules in each chamber; style short or elongated; stigma capitate, 2-4-lobed. *Fruit* a coriaceous 2-4-locular 2-4-valved capsule, with 1-2 seeds in each loculus. *Seeds* with a fleshy arillus.

Trees or shrubs; leaves alternate, 3-foliolate or imparipinnate; leaflets opposite or alternate, very often multi-jugate, very rarely 2-jugate; inflorescence an axillary panicle.

Species over 200, natives of America, Africa, and Madagascar; 6 species in South Africa, occurring in the Transvaal, Natal, and the eastern districts as far as the Komgha district.

95. MALPIGHIACEÆ.

Flowers bisexual, rarely some unisexual by abortion, sometimes dimorphic. *Calyx* 5-partite, imbricate or very rarely valvate, all, or very often only 4 (rarely 3 or 0), 2-glandular without. *Petals* 5, very often fimbriated or toothed, rarely entire, usually clawed, *Disc* inconspicuous. *Stamens* usually 10, either all perfect or some malformed or without anthers, 5 or fewer sometimes absent; filaments often connate at the base; anthers 2-theous. *Ovary* superior, 3- (rarely 2-4-) chambered, or gynæcium of more or less free carpels, with a single ovule in each ovary-chamber or carpel; styles usually 3, more rarely 2, very rarely 1 by abortion, free or connate at the base; stigma terminal or sub-lateral. *Fruit* breaking up into separate carpels, usually 3, sometimes fewer, 1-seeded, sometimes connate into a fleshy or woody drupe, frequently winged, dehiscent or indehiscent. *Seeds* various; embryo straight or curved; endosperm 0.

Trees or shrubs, rarely small shrubs, often climbing; leaves opposite or alternate, sometimes whorled, simple, petioled, sometimes lobed; petiole often with glands; stipules present or absent; inflorescence a corymbose raceme or an umbel, sometimes a panicle, axillary or terminal; bracts and bracteoles usually present.

Genera 61, with about 600 species, mostly massed in America scantily represented in Africa, and still more so in Asia.

Tribe **Hireæ**: Stamens all perfect, very rarely some imperfect; styles 3, or by abortion style 1, free; mericarps 1-3, accumbent on a torus, 1-7-winged; wings lateral, solitary or rarely many and dorsal; stems often scandent; leaves often alternate; stipules inconspicuous or 0 (genera 1-2).

Tribe **Banisteriæ**: Stamens 10, very often all perfect; anthers appendiculate; styles 3 or 1-2 by abortion; mericarps 1-3, accumbent on a torus, dorsally winged, without lateral wings, rarely without wings or plumose; stems commonly scandent; leaves often alternate; stipules inconspicuous or 0 (genera 3-4).

- | | |
|--|---|
| 1. Carpels laterally winged | 2 |
| Carpels dorsally winged | 3 |
| 2. Styles 3; fruit-carpels with a shield-like wing | 1. <i>Triaspis</i> , Burch. |
| Style usually 1, with 1-2 reduced to papillae; fruit-carpels with several stellately spreading wings | 2. <i>Tristellateia</i> , Thou. |
| 3. Styles 3; leaves opposite or whorled | 3. <i>Sphedamnocarpus</i> , Planch. |
| Styles 2; leaves usually alternate | 4. <i>Acridocarpus</i> , Guill. & Perr. |

4206

1. TRIASPIS, Burch.

Calyx short, 5-partite, eglandular. *Petals* clawed, with the blade fimbriated at least at the base. *Stamens* 10, all perfect; filaments often unequal, free or connate with the base of the ovary; anthers linear-oblong, glabrous. *Ovary* 3-chambered, winged on the margin; styles 3, distinct, curved; stigma lateral, immediately below the curved tip of the style. *Fruit* separable, each fruit-carpel winged on the margin, with the wing forming a shield-like structure with or without a keel or crest in the centre. *Seeds* globose or oblong; embryo hooked.

Shrubs, often scandent; leaves opposite or sub-alternate, entire, eglandular or minutely glandular; stipules sub-foliaceous or 0; inflorescence an axillary or terminal panicle, raceme, or corymb, with the flowers in umbels or clusters on the racemes; bracts and bracteoles present.

An African genus of about 25 species; 5 species in South Africa, extending from the Transvaal to the north-western districts and S.W. Africa.

4207

2. TRISTELLATEIA, Thouars

Calyx 5-partite, eglandular or with minute glands. *Petals* 5, distinctly clawed, keeled without, glabrous, sagittate-ovate. *Stamens* 10, all fertile; filaments connate at the base, articulated at the apex, with the 5 longer opposite the petals; anthers linear-oblong, acute, glabrous. *Ovary* 3-chambered; style usually 1 (1 or 2 reduced to papillæ), rarely 2 or 3; stigma minute. *Fruit* separable, each fruit-carpel bearing about 7 small linear stellately-spreading wings. *Seeds* obovoid; embryo hooked.

Woody climbers; leaves opposite or whorled, entire, often with 2 glands at the apex of the petiole; stipules minute; inflorescence a terminal and lateral raceme, sometimes a panicle; bracts and bracteoles present.

Species 17, natives of Africa, Asia, Australia, the Malay Archipelago, and Madagascar; the occurrence of this genus in South Africa is doubtful.

4219

3. SPHEdamNOCARPUS, Planch.

Calyx 5-partite, eglandular, or the glands not apparent when dry. *Petals* shortly clawed, with the blade toothed or nearly entire. *Stamens* 10, all perfect; filaments connate at the base; anthers large, glabrous. *Ovary* 3-chambered, dorsally produced into a wing; styles 3, filiform, divergent, acute. *Fruit* separable, each fruit-carpel with a vertical dorsal wing. *Seeds* ovoid, acuminate.

Woody climbers; leaves opposite or whorled, petioled, with the petiole glandular; stipules 0; flowers in umbels, collected in terminal panicles; bracts and bracteoles present.

An African genus of 5 species; 4 species found in the Transvaal and Natal.

4220

4. ACRIDOCARPUS, Guill. & Perr.

Calyx deeply 5-partite, with 1 or more sessile or sunken glands, rarely eglandular. *Petals* clawed or narrowed to the base, entire or the inner slightly fimbriated. *Stamens* 10, all perfect; filaments short, free or very nearly so; anthers large, lanceolate-oblong, glabrous, usually opening by a short or pore-like slit. *Ovary* 3-chambered, or 1 chamber abortive, dorsally winged, pilose; styles 2, long, filiform, coiled in the bud. *Fruit* separable, each fruit-carpel with a straight or oblique dorsal wing, thickened on the upper margin. *Seeds* often angled or curved; embryo curved.

Erect or climbing shrubs; leaves usually alternate, entire or sinuate, with glands at the base beneath; stipules 0; inflorescence a simple elongate corymb or panicle; bracts and bracteoles minute.

Species about 38, natives of Africa, Asia, and Madagascar; 4 species in the Transvaal, Natal, Pondoland, and the Transkei.

96. POLYGALACEÆ.

Flowers bisexual, zygomorphic. *Sepals* 5, free, strongly imbricated; the inner larger and sometimes wing-like. *Petals* 3 or 5, connate at the base and with the staminal-tube; the lowest forming a keel, crested below the apex; lateral petals small, simple or bifid; the posterior one frequently wanting. *Stamens* 8, rarely 5 or 4; the filaments usually connate into a slit tube, rarely free; anthers 1-2-theccous, usually opening by a pore or valve. *Ovary* superior, 2-chambered, rarely 3-5-chambered, or 1-chambered by abortion, with a solitary (rarely ovules 2-4-) pendulous ovule in each chamber; style simple, often dilated and 2-lobed at the apex. *Fruit* a capsule, samara, or drupe. *Seeds* pendulous, often hairy; embryo straight; endosperm copious and fleshy, or scanty, or 0.

Herbs, shrubs, or undershrubs, rarely small trees; leaves alternate, rarely opposite, simple; stipules 0; flowers usually solitary, sometimes inflorescence a spike or raceme, rarely a panicle, axillary or terminal.

Genera 10, with about 400 species; found in all warm and temperate countries.

1. Ovary 1-chambered, rarely a second rudimentary chamber present; fruit winged 2. *Securidaca*, Linn.
Ovary 2-chambered; fruit a capsule or drupe 2
2. Sepals sub-equal 3. *Muraltia*, Neck.
Lateral sepals larger than the others, often coloured and wing-like 3
3. Style simple; stigma oblique; fruit a capsule 1. *Polygala*, Linn.
Style thickened upwards, bilobed, with the posterior lobe horizontal
and the anterior lobe vertical; fruit a fleshy drupe 4. *Mundia*, Kunth

4273

1. POLYGALA, Linn.

Sepals 5; the 2 lateral much larger than the rest, wing-like and coloured. *Petals* 3-5, united at the base and attached to the staminal-tube; the lower petal keel-shaped, usually with a multifid crest below the apex; lateral petals small, simple or bifid; posterior petal frequently wanting. *Stamens* 8; filaments connate into a slit tube. *Ovary* 2-chambered; style bent upwards; stigma oblique. *Fruit* a membranous capsule, compressed, elliptic, obovate, or obcordate, often notched. *Seeds* pendulous, often hairy; endosperm copious, or scanty, rarely 0.

Herbs, undershrubs, or shrubs; leaves alternate, rarely opposite or whorled, simple; inflorescence a terminal or lateral raceme, spike, or head.

Species about 450, found in all temperate and warm countries; 74 species recorded from South Africa, widely distributed.

4275

2. SECURIDACA, Linn.

Sepals 5, unequal; 2 large, coloured and wing-like. *Petals* 3, free, adnate below to the staminal-tube; median petal hooded; if 5 petals present, then the 2 upper scale-like and rudimentary. *Stamens* 8; filaments connate into a slit tube; anthers opening by a triangular recurved valve in front. *Ovary* 1-chambered (rarely a rudimentary second chamber present), with a solitary ovule; style oblique, incurved above. *Fruit* a samara, produced into a variously shaped wing. *Seeds* glabrous; cotyledons thick, fleshy; endosperm 0.

Small trees or scandent shrubs; leaves alternate, entire; inflorescence a terminal and axillary raceme, often a panicle.

Species about 42, natives of Africa, America, and Asia; 2 species occur in Transvaal.

4278

3. MURALTIA, Neck.

Sepals 5, dry and membranous, sub-equal; the 2 lateral somewhat larger than the others. *Petals* 3, united at the base and attached to the staminal-tube; the lower one hood-shaped, with a 2-lobed crest below the apex; lateral petals oblong, free or cohering by their edges. *Stamens* 8; filaments united into a slit tube; anthers 1-theous. *Ovary* 2-celled; style incurved at the apex, truncately 2-lobed. *Fruit* a membranous capsule, compressed, with 4 horns or tubercles on the upper angles, rarely hornless. *Seeds* with endosperm.

Shrubs or undershrubs; leaves scattered or fascicled, small, rigid, often needle-like; flowers small, sub-sessile, axillary, solitary.

An African genus of 61 species, almost all massed in the south-western region, but extend to Natal and the Transvaal; a few species found in Nyassaland.

4279

4. MUNDIA, Kunth

(Mundtia, Kunth)

Sepals 5; the 2 lateral much larger than the rest, wing-like and coloured. *Petals* 3, united at the base and attached to the staminal-tube; the lowest keel-shaped, enclosing the stamens, emarginate, with a multifid crest below its apex; lateral petals small, oblong. *Stamens* 8; filaments connate into a slit tube. *Ovary* 2-chambered; style compressed, thickened upwards; stigma 2-lobed, with the posterior lobe horizontal and the anterior lobe vertical. *Fruit* a fleshy 1-2-seeded drupe.

Rigid low shrubs, with spinous tipped branches; leaves scattered, entire; flowers pedicelled, axillary, solitary.

Species 2; 1 native of South Africa, the other native of Brazil. The native species is found in the littoral strip from the Cape to East London.

97. DICHAPETALACEÆ.*

Flowers bisexual or unisexual. *Sepals* 5, free or connate, imbricated. *Petals* 5, inserted with the sepals, free and equal, or connate and unequal, broadly clawed, often narrow, 2-fid or 2-lobed, terminated by an inflexed ligule. *Disc* often of 5 free glands opposite the petals, sometimes connate into an entire or lobed cup. *Stamens* 5, alternating with the glands or lobes of the disc, free or adnate to the corolla-tube in the gamopetalous species. *Ovary* superior (in the South African species) or inferior, pubescent or villous, 2-3-chambered, with 2 pendulous ovules in each chamber. *Fruit* an oblong or compressed 1-seeded drupe. *Seed* pendulous; embryo large; endosperm 0.

Trees or shrubs, sometimes acaulescent; leaves alternate, simple, petioled, entire; stipules present; inflorescence a corymbose-cyme or sometimes a dense quasi-head.

Genera 3; species about 90, natives of Asia, Africa, and America.

4283

DICHAPETALUM, Thouars

(Chailletia, DC.)

Calyx deeply 5-parted; segments equal or unequal. *Petals* 5, free, broadly clawed, inflexed, emarginate or 2-fid at the apex. *Disc* of 5 free glands opposite the petals, or connate into a sinuate disc. *Stamens* 5; filaments

* Hutchinson "Families of Flowering Plants" refers the family to the older name, *Chailletiaceæ*.

slender or thickened ; anthers broadly oblong. *Ovary* superior, 2-3-chambered ; styles 1-3, free or connate, stigmatose at the apex. *Fruit* a leathery drupe.

Small trees or shrubs, or acaulescent with underground stems ; leaves shortly petioled ; stipules 2, caducous ; inflorescence an axillary cyme or corymb ; flowers pubescent or tomentose.

Species over 100, found in tropical countries, especially Africa ; 1 species occurs in the Transvaal (possibly a second species may be found in Bechuanaland).

98. EUPHORBIACEÆ.

Plants monoecious or dioecious. *Perianth* occasionally absent from one or both sexes, usually small, often dissimilar in the 2 sexes, simple. *Male flowers*: *Stamens* definite or indefinite (1-1000), hypogynous, very rarely perigynous ; filaments free or connate. *Pistil* rudimentary or absent. *Female flowers*: *Ovary* superior, usually 3-, frequently 2- or 4-, very rarely 1 or more than 4-chambered, with 1 or 2 pendulous inverted ovules with a ventral raphe in each chamber ; styles usually as many as and continuous with the carpels, free or more or less connate. *Disc* annular, entire or lobed, or of free contiguous or separate scales, or 0. *Fruit* usually capsular, of 2-valved cocci separating from a persistent axis, or dehiscent and drupaceous, 1-3-locular, or of a single nut or 2-3 connate nuts. *Seeds* with or without an aril or caruncle ; endosperm usually copious.

Herbs, shrubs, or trees, often with milky juice ; leaves alternate, rarely opposite or in whorls of 4, simple or rarely compound, sometimes rudimentary ; stipules present or 0 ; flowers usually small or very small ; inflorescence various.

Genera about 250, with about 4,000 species, mostly natives of the tropics of both hemispheres.

Tribe **Phyllanthæ** : Sepals valvate or imbricate in bud, 1-2-seriate ; petals, when present, small and scale-like ; stamens 1-2-seriate ; ovules 2 in each ovary-chamber (genera 1-13).

Tribe **Crotonæ** : Sepals usually small, closed or valvate, less often imbricate or open in bud ; petals, when present, always free, usually petals absent ; stamens 1-2-seriate ; ovule solitary in each ovary-chamber (genera 14-37).

Tribe **Euphorbiæ** : Apparent flower composed of a number of stamens (really male flowers), with or without one sessile or stalked ovary (really a female flower) enclosed in a cup-shaped obconic or 4-angled involucre ; the whole resembling a small male or bisexual flower ; ovary 2-3-chambered, with 1 pendulous ovule in each chamber (genera 38-40).

- | | |
|--|--|
| 1. Ovules 2 in each ovary-chamber | 2 |
| Ovule solitary in each ovary-chamber | 14 |
| 2. Leaves opposite or in whorls of 4 | 3 |
| Leaves alternate | 4 |
| 3. Leaves in whorls of 4 | 10. <i>Toxicodendron</i> , <i>Thunb.</i> |
| Leaves opposite | 13. <i>Androstachys</i> , <i>Prair.</i> |
| 4. Anthers with a conspicuous gland on the back ; capsule with 2 broad wings | 8. <i>Hymenocardia</i> , <i>Wall.</i> |
| Anthers without a conspicuous gland ; capsule not broadly winged | 5 |
| 5. Disc and rudimentary pistil absent in the male flowers ; sepals 3 | 3. <i>Heywoodia</i> , <i>Sim.</i> |
| Disc always present ; rudimentary pistil in male flowers present or absent ; calyx of 4-6 sepals, very rarely sepals 3, but then ovary 1-2-chambered | 6 |
| 6. Disc of villous glands | 2. <i>Lachnostylis</i> , <i>Turez.</i> |
| Disc of glabrous glands | 7 |
| 7. Ovary hairy | 8 |
| Ovary glabrous | 9 |

8. Stamens 4, 15 or 20-25; filaments free; disc in female flower annular or cup-shaped; ovary tomentose or hirsute . . . 7. *Drypetes*, *Vahl*.
 Stamens 5; filaments connate for part of their length; disc in female flower closely embracing the base of the ovary; ovary densely villous . . . 4. *Pseudolachnostylis*, *Pax*
9. Petals present . . . 10
 Petals absent . . . 12
10. Disc in the female flower single, cup-like . . . 1. *Andrachne*, *Linn*.
 Disc in the female flower double; the inner cup-like and surrounding the ovary . . . 11
11. Tertiary nerves of the leaves usually parallel; fruit drupaceous . . . 12. *Bridelia*, *Willd*.
 Tertiary nerves of the leaves not parallel; fruit capsular . . . 11. *Cleistanthus*, *Hook. f.*
12. Rudimentary pistil absent in the male flowers . . . 6. *Phyllanthus*, *Linn*.
 Rudimentary pistil present in the male flowers . . . 13
13. Fertile ovary 1-, rarely 2-, chambered; inflorescence a raceme or spike . . . 9. *Antidesma*, *Linn*.
 Fertile ovary 3-chambered; flowers in axillary fascicles . . . 5. *Fluggea*, *Willd*.
14. Apparent flower consisting of a number of stamens (rarely male flowers) with or without an ovary (really a female flower) enclosed in a cup-like obconic or 4-angled involucre; the whole resembling a small male or bisexual flower . . . 15
 Flowers normal; plants monoecious or dioecious . . . 17
15. Involucre entire or occasionally with 1-5 cut-like notches . . . 40. *Synadenium*, *Boiss*.
 Involucre of separate glands . . . 16
16. Fruit indehiscent, thickly fleshy . . . 39. *Elaeophorbia*, *Stapf*
 Fruit separating into 3 lobes or loculi, not fleshy, or but rarely so . . . 38. *Euphorbia*, *Linn*.
17. Fertile ovary closely beset with narrow subulate gland-tipped processes . . . 16. *Caperonia*, *St. Hill*.
 Fertile ovary glabrous, hairy, scaly, or covered with resinous glands . . . 18
18. Ovary stellately hairy, scaly, or covered with resinous glands . . . 19
 Ovary glabrous or hairy, but not with stellate hairs . . . 20
19. Disc present in the male and female flowers . . . 14. *Croton*, *Linn*.
 Disc absent . . . 24. *Macaranga*, *Thouars*
20. Rudimentary pistil present in the male flowers . . . 21
 Rudimentary pistil absent in the male flowers, very rarely present and minute . . . 22
21. Petals present . . . 33. *Cluytia*, *Linn*.
 Petals absent . . . 32. *Cephalocroton*, *Hochst*.
22. Leaves opposite . . . 23
 Leaves alternate, or at the branching nodes nearly opposite . . . 24
23. Calyx splitting into 3 lobes; ovary hairy . . . 20. *Mercurialis*, *Linn*.
 Calyx deeply 5-lobed; ovary glabrous . . . 19. *Adenocline*, *Turez.*
24. Disc present, at least in the female flowers . . . 25
 Disc absent, very rarely present, but then obscure . . . 28
25. Petals 5, at least in the male flowers . . . 26
 Petals absent . . . 27
26. Inflorescence a terminal dichotomous cyme; the female flowers solitary, terminal; the male flowers lateral . . . 31. *Jatropha*, *Linn*.
 Inflorescence a short dense sessile axillary raceme . . . 15. *Chrozophora*, *Neck*.
27. Herbs, rarely succulent; disc in female flowers of 3 broad glands . . . 19. *Adenocline*, *Turez*.
 Trees or shrubs; disc in female flowers with a membranous margin; leaves gland-dotted . . . 34. *Gelonium*, *Roxb*.
28. Leaves large, peltate . . . 30. *Ricinus*, *Linn*.
 Leaves not peltate . . . 29

29. Inflorescence surrounded by 2 showy bracts ; a twining or climbing undershrub **29. Dalechampia**, *Linn.*
 Inflorescence not surrounded by showy bracts 30
30. Ovary hairy 31
 Ovary glabrous or covered with resinous glands 35
31. Styles connate into a hollow cylindric or sub-globose fleshy column, crowned by the free stigmatic lobes **28. Plukenetia**, *Linn.*
 Styles free or more or less connate, but not forming a distinct column 32
32. Leaves cordate at the base ; stamens 30-60 ; styles densely papillose **27. Ctenomeria**, *Harv.*
 Stamens few (3-8) 33
33. Calyx in the female flower reduced to a single short narrow bract or obsolete **21. Leidesia**, *Muell. Arg.*
 Calyx in the female flower 3-6-partite 34
34. Twining or sub-erect herbs, usually copiously beset with stinging hairs ; calyx-lobes in the female flowers palmately-lobulate **26. Tragia**, *Linn.*
 Herbs, shrubs, or trees ; stinging hairs absent ; calyx-lobes in the female flowers not lobulate **25. Acalypha**, *Linn.*
35. Stamens 15-30 36
 Stamens 2-8 37
36. Stipules modified into conical thorns **18. Erythrococca**, *Benth.*
 Stipules very small **17. Micrococca**, *Benth.*
37. Herbaceous plants 38
 Shrubs or trees 39
38. Ovary 2-chambered **22. Seidelia**, *Baill.*
 Ovary 3-chambered **25. Acalypha**, *Linn.*
39. Filaments and styles connate 40
 Filaments free ; styles sometimes connate 41
40. Inflorescence a spike, terminating specialised contracted twigs ; filaments united below **37. Maprounea**, *Aubl.*
 Inflorescence a lateral catkin-like spike ; filaments united throughout into a slender tube **35. Spirostachys**, *Sond.*
41. Leaves 3-7-nerved from the base 42
 Leaves with a single midrib 44
42. Bracts subtending the female flowers becoming foliaceous in fruit **25. Acalypha**, *Linn.*
 Bracts not becoming foliaceous in fruit 43
43. Bracts reflexed, rusty-pubescent **24. Macaranga**, *Thouars*
 Bracts erect, glabrous **23. Alchornea**, *Sw.*
44. Inflorescence axillary or lateral **23. Alchornea**, *Sw.*
 Inflorescence terminal **36. Sapium**, *P. Br.*

4286

1. ANDRACHNE, *Linn.*

Plants monœcious. *Petals* present. *Male flowers* : *Sepals* 5 or 6. *Petals* sub-equal to the sepals. *Disc* cup-like, crenulate. *Stamens* 5 or 6, free or connate at the base. *Pistil* rudimentary, 3-partite. *Female flowers* : *Sepals* 5 or 6. *Petals* 5 or 6. *Disc* cup-like, crenulate. *Ovary* 3-chambered, with 2 ovules in each chamber ; styles bifid or bipartite. *Capsule* 3-lobed, with the lobes keeled. *Seeds* wrinkled ; endosperm fleshy ; embryo curved.

Diffuse herbs, undershrubs, or slender shrubs ; leaves alternate, petiolate, stipulate ; flowers axillary, pedicellate ; the male often fasciculate ; the female solitary.

Species about 20, found in the warmer parts of the northern hemisphere ; 1 species occurs in South Africa, and extends from the northern Transvaal, and Natal, through the eastern districts to George.

4291

2. LACHNOSTYLIS, Turcz.

Plants dioecious. *Petals* present. *Male flowers*: *Sepals* 5, sub-equal, imbricate. *Petals* 5, slightly larger than the sepals. *Disc-glands* thick, villous. *Stamens* 5; filaments connate below, spreading above around a villous tripartite rudimentary pistil. *Female flowers*: *Sepals* and *petals* as in the male. *Disc* annular, thick, villous. *Ovary* ovoid-globose, 3-chambered, with 2 ovules in each chamber, tomentose; styles shortly bifid. *Capsule* breaking up into 2-valved cocci. *Seeds* sub-globose, smooth; endosperm scanty.

A much-branched shrub; leaves alternate, entire, stipulate; flowers fasciculate in the leaf-axils; the male shortly pedicellate; the female long-pedicellate, fewer than the male or sub-solitary.

Endemic; species 1, found in the coastal strip from Swellendam to Port Elizabeth.

4291a

3. HEYWOODIA, Sim

Plants dioecious. *Petals* present. *Male flowers*: *Sepals* 3, unequal, imbricate. *Petals* 5, about twice the size of the sepals, strongly imbricate. *Disc* 0. *Stamens* 5-10, inserted in the middle of the flowers; filaments short, connate at the base. *Pistil* 0. Young *female flowers* not known. *Capsules* in axillary fascicles of 3-4, pedicellate, breaking up into 2-valved cocci.

A large tree; leaves alternate, petiolate, entire; stipules caducous; male flowers in dense axillary glomerules; female flowers in axillary fascicles of 3-4, pedicellate.

Endemic; species 1, found in the Transkei and Pondoland.

4295

4. PSEUDOLACHNOSTYLIS, Pax

Plants dioecious. *Petals* 0. *Male flowers*: *Sepals* 5, imbricate. *Disc* annular, glabrous. *Stamens* 5; filaments connate for part of their length. *Pistil* rudimentary, in the middle of the staminal-column. *Female flowers*: *Sepals* as in the male. *Disc* annular, closely embracing the base of the ovary, often irregularly toothed. *Ovary* 3-chambered, densely villous (at least in the South African species), with 2 ovules in each chamber; styles 3, very slightly connate at the base, bilobed. *Capsule* globose or depressed-globose. *Seed* solitary in each loculus; endosperm fleshy.

Trees or shrubs; leaves alternate, petiolate, stipulate (at least in the South African species); male inflorescence a few-flowered axillary pedunculate cyme, surrounded by membranous bracts; female flowers axillary, solitary or sub-solitary.

Species 4, found in southern tropical Africa; 1 species extends into the Transvaal.

4298

5. FLUGGEA, Willd.

Plants dioecious. *Petals* 0. *Male flowers*: *Sepals* 5, imbricate. *Stamens* 5; filaments free. *Disc* glandular. *Pistil* present, large, deeply 2-3-partite. *Female flowers*: *Sepals* as in the male. *Disc* flat, annular, entire or nearly so. *Ovary* 3-chambered, with 2 ovules in each chamber; style connate at the base, or nearly absent, bifid. *Fruit* slightly fleshy. *Seeds* sub-3-angled, rounded on the back; endosperm scanty.

Shrubs or trees; leaves alternate, petiolate, stipulate, entire; flowers in axillary fascicles; male often numerous; female few or solitary.

Species about 10, found in the tropics generally; 1 species occurs in South Africa and extends from the northern Transvaal to Natal.

4299

6. PHYLLANTHUS, Linn.

Plants monœcious or sometimes diœcious. *Petals* 0. *Disc* always present in the African species. *Male flowers*: *Sepals* 4-6, free or slightly joined at the base, imbricate. *Disc* of separate glands, very rarely annular. *Stamens* 2-6, in the middle of the flower; filaments free or connate, or some free and the others connate. *Pistil* 0. *Female flowers*: *Sepals* as in male, but often large. *Disc* usually saucer- or cup-shaped, or rarely of separate glands. *Ovary* usually 3-chambered, with 2 ovules in each chamber; styles 3, rarely 0, free or partially connate, bifid or bilobed, rarely entire. *Capsule* dry or more or less fleshy; dehiscent or sub-dehiscent, breaking up into 2-valved cocci. *Seeds* 3-angled, convex on the back and often longitudinally sulcate or pitted; endosperm fleshy.

Herbs, shrubs, or trees; leaves alternate (in all the African species), stipulate, entire; flowers axillary; the male mostly numerous and fasciculate, usually pedicellate; the female few and mostly solitary.

Species about 450, spread throughout the tropical regions of both hemispheres; 19 species found in South Africa, with a wide distribution.

4369

7. DRYPETES, Vahl.

Plants diœcious. *Petals* 0. *Male flowers*: *Sepals* 4 or 5, imbricate. *Stamens* 3 to many (in the South African species stamens 4, 15, 20-25); filaments free. *Disc* concave or rarely cup-like. *Pistil* 0, or rarely represented by a small conical production in the middle of the disc. *Female flowers*: *Calyx* as in the male. *Disc* annular or cup-shaped. *Ovary* 1-4-chambered, tomentose or hirsute (at least in the South African species), with 2 ovules in each chamber; styles short, or 0; stigmas thick, flattened, bifid or entire. *Fruit* globose, ellipsoid, or ovoid, indehiscent. *Seed* solitary by abortion; endosperm fleshy.

Trees or shrubs; leaves alternate, entire or toothed; stipules caducous, rarely persistent; flowers fasciculate in the axils of the leaves, or produced on the older branches of the stem, usually pedicellate.

Species over 70, found chiefly in the Old World Tropics, a few in the West Indies and South America; 3 species occur in South Africa and are found in Natal and Pondoland.

4325

8. HYMENOCARDIA, Wall.

Plants diœcious. *Petals* 0. *Disc* 0. *Male flowers*: *Calyx* 4-5- (rarely 6-) lobed. *Stamens* usually 5; filaments connate at the base or free; anthers usually with a conspicuous yellow or golden-coloured gland on the back (gland present in the only South African species). *Pistil* rudimentary, as long as the filaments, bifid or entire. *Female flowers*: *Sepals* distinct, caducous. *Ovary* 2-chambered, with 2 ovules in each chamber; styles 2, free from the base, entire. *Capsule* flat, of 2 compressed very broadly winged cocci separating from a central axis. *Seed* usually solitary in each coccus; endosperm not copious.

Trees or tall shrubs; leaves alternate, stipulate, petiolate, entire; male inflorescence a catkin-like spike; female inflorescence shortly racemose.

Species 8; 1 species found in India; the remainder in tropical Africa, but one of these extends into South Africa and has been recorded from Delagoa Bay.

4327

9. ANTIDESMA, Linn.

Plants diœcious. *Petals* 0. *Male flowers*: *Calyx* deeply 3-5-lobed or -partite; lobes or segments imbricate. *Disc* sub-entire or consisting of distinct glands. *Stamens* 2-5. *Pistil* small, rudimentary. *Female flowers*: *Calyx* as in the

male. *Disc* often shortly embracing the base of the ovary. *Ovary* 1- (very rarely 2-) chambered, with 2 ovules in each chamber; styles 3, usually 2-lobed. *Fruit* a drupe. *Seed* solitary by abortion (very rarely seeds 2); endosperm fleshy.

Trees or shrubs; leaves alternate, stipulate; inflorescence a raceme or spike, often very slender, solitary or more rarely sub-paniculate towards the ends of short branchlets; bracts small, usually ciliate.

Species about 80, distributed throughout the warmer regions of the Old World; 1 species in South Africa, found in the northern Transvaal and Natal, and extends into tropical Africa.

4336

10. TOXICODENDRON, Thunb.

Plants diœcious. *Petals* 0. *Disc* 0. *Male flowers*: *Sepals* 5-6. *Stamens* indefinite, densely inserted on a broad receptacle. *Pistil* 0. *Female flowers*: *Sepals* 6, in 2 series; the outer series smaller than the inner. *Ovary* hairy, 3-4-chambered, with 2 ovules in each chamber; styles 3-5, connate below. *Capsule* depressed-globose, dehiscent into 2-valved cocci. *Seeds* shining; endosperm fleshy.

A small tree or shrub; leaves in whorls of 4, entire; flowers axillary; male in dense pedunculate or sub-sessile cymes; female sessile, 1-3 in each leaf-axil.

Endemic; species 1, only known from the Van Rhynsdorp and Clanwilliam districts.

4343

11. CLEISTANTHUS, Hook. f.

Plants monœcious or diœcious. *Petals* usually present. *Male flowers*: *Calyx-segments* 5, valvate. *Petals* 5 or rarely 0, scale-like, small. *Disc* entire or sinuately lobed. *Stamens* 5; filaments connate below. *Pistil* rudimentary, in the middle of the staminal-column. *Female flowers*: *Calyx* less deeply divided than in the male. *Disc* double; the inner cup-like and surrounding the ovary. *Ovary* 3-chambered, with 2 ovules in each chamber; styles distinct, bifid. *Capsule* often 3-lobed, splitting into three 2-valved cocci. *Seeds* 2 or seed solitary in each loculus; endosperm scanty.

Trees or shrubs; leaves alternate; stipules present (deciduous); inflorescence a very short raceme, or flowers in axillary fascicles.

Species about 50, mostly Indian and Malayan, a few in New Caledonia, Australia, Madagascar, and tropical Africa; 1 species found at Delagoa Bay.

4345

12. BRIDELIA, Willd.

Plants monœcious or rarely diœcious. *Petals* present. *Male flowers*: *Sepals* 5, usually small and scale-like. *Disc* entire or sinuately lobed. *Stamens* 5; filaments connate below. *Pistil* rudimentary, at the apex of the staminal-column. *Female flowers*: *Sepals* often narrower than those of the male. *Disc* double; the outer annular; the inner often cup-like and embracing the ovary. *Ovary* 2- (rarely 3-) chambered, with 2 ovules in each chamber; styles distinct, or shortly connate at the base, bilobed or sub-entire. *Fruit* a small berry or drupe. *Seed* often solitary in each pyrene; endosperm usually fleshy.

Shrubs or trees; leaves alternate, petiolate, entire; stipules present; flowers in axillary glomerules, rarely in spicate clusters; the male numerous and sub-sessile; the female fewer or solitary, sometimes distinctly pedicellate; bracts small and scaly.

Species about 41, found in tropical Asia extending through the Malay Archipelago to New Caledonia and Australia; a few in Madagascar; 16 species in tropical Africa; 6 species occur in South Africa, found in the Transvaal and Natal.

4345a

13. ANDROSTACHYS, Prain

Plants dioecious. *Petals* 0. *Disc* 0. *Male flowers*: *Calyx* composed of 2-5 bract-like free spirally arranged sepals. *Stamens* very many, spirally arranged on a prolonged axis; lowest filaments very short and recurved, the remaining anthers sessile. *Pistil* 0. *Female flowers*: *Calyx* 5-partite; segments ovate, acuminate, imbricate. *Ovary* 3-4-chambered, densely pilose, with 2 ovules in each chamber; styles connate into a pilose column; stigmas 3, spreading. *Capsule* breaking up into three or four 2-valved cocci. *Seeds* compressed; endosperm fleshy.

A tall erect tree; branchlets angular and articulated; leaves decussate, long-petioled, more or less silky beneath; stipules large, connate, forming a sheath enclosing the flowers and young leaves; flowers in the axils of the leaves (male 3-nate, female solitary); peduncles of male flowers usually more or less connate, the lateral peduncles rather shorter than the central.

Species 1, found in Swaziland and extending in Portuguese East Africa.

4348

14. CROTÓN, Linn.

Plants monœcious, rarely dioecious. *Male flowers*: *Calyx* deeply divided into 5, rarely 4 or 6, segments, or sometimes sepals free. *Petals* usually present, equalling or shorter than the sepals. *Disc* glandular, free or adnate to the base of the sepals. *Stamens* 5 to many, inserted on a usually pilose receptacle; filaments free. *Pistil* 0. *Female flowers*: *Calyx* usually smaller than in the male, somewhat accrescent in fruit. *Petals*, when present, rarely as large as those of the male, often much reduced or obsolete and replaced by tufts of hairs, occasionally quite absent. *Disc-glands* as in the male or at times connate in a ring. *Ovary* usually 3-chambered, occasionally 2- or 4-chambered, covered with stellate hairs or densely scaly (at least in the South African species), with a single ovule in each chamber; styles usually recurved, 1-3-times 2-fid or -partite, rarely multifid. *Capsule* normally 3-dymous, breaking up into 2-valved cocci, rarely sub-indehiscent. *Seeds* smooth; endosperm copious, fleshy.

Trees or shrubs, rarely herbs, of varied habit, usually beset with stellate hairs or orbicular scales; leaves usually alternate, rarely opposite or verticillate, entire or toothed, rarely lobed, usually with 2 prominent glands at the apex of the petiole; inflorescence a spike or raceme; in monœcious plants usually with many males above and a few basal females, occasionally with both sexes mixed.

Species about 600, spread throughout the tropics of both hemispheres, with a few species extending or confined to sub-tropical regions; 8 species found in South Africa, extending from the Transvaal and Natal to the Uitenhage district, but also found in Griqualand West, Bechuanaland, and S.W. Africa.

4355

15. CHROZOPHORA, Neck.

Plants monœcious. *Male flowers*: *Calyx* 5-partite. *Petals* 5, equalling or shorter than the sepals. *Disc* inconspicuous. *Stamens* 5-15; filaments connate, more or less in 1-3 series. *Pistil* 0. *Female flowers*: *Calyx-segments* narrow. *Petals* narrow, sometimes small, setaceous, or 0. *Disc* glandular, alternating with the petals. *Ovary* 3-chambered, with a single ovule in each chamber; style 2-fid. *Capsule* somewhat fleshy, splitting into 3 cocci. *Seed* sometimes rough; endosperm fleshy.

Branching herbs, often spreading, covered with stellate hairs or hispid; leaves alternate, often undulate-toothed; inflorescence a short dense sessile axillary raceme.

A genus found in the Mediterranean Region, Asia, and tropical Africa; 1 species recorded from the northern Transvaal.

4361

16. CAPERONIA, St. Hill.

Plants monœcious, rarely diœcious. *Disc* 0. *Male flowers*: *Calyx* closed in bud, splitting into 3 valvate lobes. *Petals* 5, imbricate, often unequal. *Stamens* usually 10; filaments connate below, distinctly 2-seriate above. *Pistil* rudimentary, cylindric, crowning the staminal-column. *Female flowers*: *Sepals* 5-6, rarely more numerous, somewhat unequal, imbricate. *Petals* 5, sub-equal, narrower than in the male. *Ovary* closely beset with narrow-subulate gland-tipped processes (at least in the South African species), 3-chambered, with a single ovule in each chamber; styles 3, slightly connate below, ovate, deeply laciniate. *Capsule* splitting into three 2-valved cocci; valves externally covered with flattened or subulate processes mixed with or passing into gland-tipped setæ. *Seeds* nearly globose, minutely punctate-reticulate; endosperm fleshy.

Erect annual herbs, with branching stems; leaves alternate; inflorescence an axillary raceme, with numerous male flowers above and a few basal female flowers.

Species about 12, mainly tropical South American, a few African; 1 species, also occurring in tropical Africa, found at Delagoa Bay.

4367

17. MICROCOCCA, Benth.

Plants diœcious or monœcious. *Male flowers*: *Calyx* splitting into 3 valvate lobes. *Petals* 0. *Stamens* 3-30 (about 15 in the South African species); filaments free; minute inter-staminal glands present or absent. *Pistil* 0. *Female flowers*: *Calyx* 3-4-partite; lobes imbricate. *Petals* 0. *Ovary* 3-chambered (in the South African species), rarely 4-chambered, with a solitary ovule in each chamber; styles 3, rarely 4, free, plumose-laciniate throughout. *Disc* composed of linear or flattened hypogynous scales alternating with the carpels. *Capsule* breaking up both septicidally and loculicidally into 3, rarely 4, 2-valved cocci. *Seeds* globose, with a thin aril; endosperm fleshy.

Shrubs or herbs; leaves alternate; stipules very small; inflorescence a raceme, usually 1-sexual, occasionally androgynous; male flowers glomerulate, occasionally with a central female flower; rarely the racemes mainly male with a solitary terminal female flower; bracts small.

Species 9; 2 species confined to the Mascarene Islands, 3 species to south-east Asia; 3 species African, one of which extends into Natal and Pondoland; 1 species is widely distributed in all three regions.

4368

18. ERYTHROCOCCA, Benth.

Plants diœcious. *Male flowers*: *Calyx* splitting into 3-4 valvate lobes. *Petals* 0. *Stamens* 2-60 (15-30 in the South African species), usually intermixed with small glands, and sometimes surrounded by a ring of similar free or connate glands; filaments free; anther-thecae free from the base. *Pistil* 0. *Female flowers*: *Calyx* 2- (less often 3-4-) partite. *Petals* 0. *Disc* usually of 2-3 free scales or lobes. *Ovary* 2-3-chambered, with a single ovule in each chamber; styles usually connate below; stigmas plumosely laciniate. *Capsule* 2-coccus, less often 3-coccus, or by abortion 1-coccus. *Seeds* sub-globose, covered by a thin aril; endosperm fleshy.

Shrubs; leaves alternate; stipules cartilaginous, often accrescent and modified into weak thorns or spines; flowers usually in racemes; peduncles slender; pedicels capillary, articulate; male flowers usually several, female flowers usually solitary to each bract.

Species 40, all African, 1 of which extends from Abyssinia to Arabia; 2 species found in Natal.

4370

19. ADENOCLINE, Turcz.

Plants dioecious, very rarely monœcious. *Male flowers*: *Calyx* deeply 5-lobed; lobes imbricate. *Petals* 0. *Disc* glandular. *Stamens* usually 10, sometimes fewer or more (6-12); filaments free. *Pistil* 0. *Female flowers*: *Calyx* deeply 5-lobed; lobes as long as the ovary, imbricate. *Petals* 0. *Disc* of 3 broad glands. *Ovary* 3-chambered, with a solitary ovule in each chamber; styles 2-partite, slightly united at the base. *Capsule* 3-dymous, breaking up into 2-valved cocci. *Seeds* globose; endosperm fleshy.

Slender erect or diffuse firm, rarely succulent, herbs; leaves alternate, very rarely opposite, entire or toothed; flowers in axillary cymules; cymules often passing into a terminal raceme or panicle; male flowers usually several; female flowers few or solitary, usually forming uniparous cymes, their pedicels abruptly reflexed.

Endemic; species 8, extending from the northern Transvaal through Natal and the coastal belt to Clanwilliam; also recorded from the Graaff-Reinet and Willowmore districts.

4371

20. MERCURIALIS, Linn.

Plants dioecious. *Male flowers*: *Calyx* splitting into 3 valvate lobes. *Petals* 0. *Stamens* 8-20; filaments free. *Disc* 0. *Pistil* 0. *Female flowers*: *Calyx* 3-sect to the base. *Petals* 0. *Ovary* 2-chambered and hairy (in the South African species), rarely 3-chambered, with a single ovule in each chamber; styles free almost to the base, papillose, undivided. *Capsule* 2- (very rarely 3-) dymous, breaking up into 2-valved cocci. *Seeds* ovoid or globose; endosperm fleshy.

Annual or perennial herbs; leaves opposite, often toothed; inflorescence an axillary raceme; the male slender, with the flowers in sparse distant clusters on the distal half of the rachis; female usually very short, with 1-2 sub-sessile axillary flowers.

Species 6, natives of Europe; 1 species occurs in South Africa as a weed, and recorded from the Cape.

4372

21. LEIDESIA, Muell. Arg.

Plants monœcious. *Male flowers*: *Calyx* splitting into 3 valvate lobes. *Petals* 0. *Disc* 0. *Stamens* 3-7; filaments sometimes connate below. *Pistil* 0. *Female flowers*: *Calyx* reduced to a single short narrow bract, or obsolete. *Petals* 0. *Disc* 0. *Ovary* 2-chambered, with a solitary ovule in each chamber, hairy; styles 2, free, entire. *Capsule*, 2-dymous, or occasionally by abortion 1-locular, globose, hispidulous. *Seeds* sub-globose; endosperm fleshy.

Delicate annual branching herbs; leaves alternate, or nearly opposite at the branching nodes, ovate or orbicular; inflorescence a raceme, terminal or in dichasia; male flowers minute, in numerous fascicles towards the apex of the raceme; female flowers few towards the base of the rachis, subtended by a leafy bract.

Endemic; species 3, extending from the Transvaal and Natal, through the coastal belt to the Cape; also found in the Willowmore and Somerset East districts and in S.W. Africa.

4373

22. SEIDELIA, Baill.

Plants monœcious. *Male flowers*: *Calyx* splitting into 3 valvate lobes. *Petals* 0. *Disc* 0. *Stamens* usually 3, less often 2, central; filaments connate below; anther-thecae deeply grooved. *Pistil* 0. *Female flowers*: *Calyx* deeply 3-lobed. *Petals* 0. *Ovary* 2-chambered, with a solitary ovule in each chamber; styles 2, short, slender, undivided. *Capsule* 2-dymous; cocci 2-valved. *Seeds* ovoid; endosperm fleshy.

Small annual glabrous herbs; leaves alternate, narrow; flowers small, in glomules or cymules at the ends of the branches or in the upper leaf-axils, shortly pedicelled; the upper densely clustered, all male; those below female.

Endemic; species 2, recorded from the Uitenhage, Richmond, and Kimberley districts.

4388

23. *ALCHORNEA*, Sw.

Plants diœcious, rarely monœcious. *Male flowers*: *Calyx* splitting into 4 (rarely 3 or 2) valvate lobes. *Petals* 0. *Disc* usually 0. *Stamens* 8 or fewer; filaments free or nearly so. *Pistil* 0. *Female flowers*: *Calyx* 3-6- (usually 4-) lobed; lobes imbricate. *Ovary* 2-3-chambered, glabrous or softly adpressed-pubescent (in the South African species), with a single ovule in each chamber; styles free, usually entire. *Capsule* 2-3-coccous; cocci 2-valved. *Seeds* sub-globose; endosperm fleshy.

Trees or shrubs; leaves alternate, entire or toothed, often 3-5-nerved at the base, and frequently glandular beneath between the nerves at the base; male inflorescence in an axillary or lateral simple or branched spike, several to a bract; female inflorescence in an axillary spike or raceme, solitary to a bract; bracts usually small or very small, sometimes long-linear.

Species about 35, widely spread throughout the tropics; 2 species occur in South Africa, found at Delagoa Bay and in Zululand.

4400

24. *MACARANGA*, Thouars

Plants diœcious, rarely monœcious. *Male flowers*: *Calyx* splitting into 3-4 valvate lobes. *Petals* 0. *Disc* 0. *Stamens* usually few, occasionally solitary, rarely numerous (2-3 in the South African species); filaments very short, usually free; anthers usually 4-theous and 4-valved, but in the only South African species almost always 2-theous and 2-valved. *Pistil* 0. *Female flowers*: *Calyx* truncate or toothed, ultimately wide-ecupular or obliquely-spathaceous, rarely splitting into 2-3 lobes. *Ovary* 2-3- (rarely 4-6-) chambered, sometimes by abortion 1-chambered, (2-chambered in the only South African species), with a single ovule in each chamber; styles free or shortly connate at the base, entire. *Capsule* 2 to several- (rarely 1-) coccous; cocci 2-valved. *Seeds* globose; endosperm fleshy.

Trees or shrubs; leaves alternate, petioled, simple, entire or lobed, usually 3-7-nerved from the base, often glandular-punctate beneath; inflorescence a raceme or spike, lateral or forming a terminal thyrsoid panicle; male flowers glomerulate, several to a bract; female flowers solitary to each bract; bracts entire, or toothed, or fimbriate.

Species about 100, spread throughout the tropics of the Old World; a single species occurs in Zululand, Natal, and Pondoland.

4407

25. *ACALYPHA*, Linn.

Plants monœcious, rarely diœcious. *Male flowers*: *Calyx* splitting into 4 valvate lobes. *Petals* 0. *Disc* 0. *Stamens* usually 8, attached to a slightly raised receptacle; filaments free. *Pistil* 0. *Female flowers*: *Calyx* 3-4-partite; lobes almost free, imbricate, very small. *Petals* 0. *Disc* 0. *Ovary* 3-chambered, hairy (in the South African species), papillose, glandular, or rarely nearly glabrous, with a single ovule in each chamber; styles free or connate below, lacinate or denticulate, very rarely entire or merely 2-lobed. *Capsule* 3-locular, slightly 3-lobed. *Seeds* ellipsoid or sub-globose; endosperm fleshy.

Herbs, shrubs, or trees ; leaves alternate, 3-7-nerved from the base, usually toothed ; inflorescence various, axillary, or terminal, or both, androgynous or 1-sexual ; in androgynous inflorescences the female flowers usually basal, rarely apical ; in 1-sexual inflorescences the male flowers in axillary spikes below the female, rarely in axillary spikelets above, more usually in a close-set terminal spike, rarely in a loose terminal panicle ; occasionally terminal female spikes and axillary male spikes occur on separate plants or on distinct branches of the same plant.

Species about 300, spread throughout the warmer regions of both hemispheres ; a few in extra-tropical America ; 19 species found in South Africa, mainly eastern, extending from the Transvaal and Natal, through the coastal belt to Stellenbosch ; found also in Bechuanaland and Namaqualand

4416

26. TRAGIA, Linn.

Plants monœcious, rarely dicecious. *Male flowers* : *Calyx* closed in bud, splitting into 3, rarely 4-6, valvate lobes. *Petals* 0. *Disc* 0 or obscure. *Stamens* normally 3, very rarely fewer or more ; filaments free. *Pistil* rudimentary, minute or obsolete. *Female flowers* : *Calyx* 6-partite ; lobes more or less 2-seriately imbricate, palmately lobulate, occasionally lobes 4-5, usually enlarged and hardened in fruit. *Ovary* 3-chambered, setose or densely hispid in the South African species, with a single ovule in each chamber ; styles 3, more or less distinctly connate at least at the base, entire. *Capsule* 3-dyrrous, breaking up into three 2-valved cocci. *Seeds* globose ; endosperm fleshy.

Twining or sub-erect herbs, usually copiously beset with stinging hairs on the stem, leaves, and calyx ; leaves alternate, stipulate ; inflorescence a raceme, terminal or leaf-opposed, with many male flowers above and usually few basal female flowers ; bracts small, persistent.

Species about 100, spread throughout the warmer regions of both hemispheres ; 12 species in South Africa, extending from the Transvaal, Swaziland, and Natal to East London ; also found in Bechuanaland.

4416a.

27. CTENOMERIA, Harv.

Plants monœcious. *Male flowers* : *Calyx* 5-lobed ; lobes valvate. *Petals* 0. *Disc* 0. *Stamens* 30-60 ; filaments free. *Pistil* 0. *Female flowers* : *Calyx* 6-partite ; segments pectinately lobulate on each side. *Petals* 0. *Disc* 0. *Ovary* 3-chambered, setose, with a single ovule in each chamber ; styles 3, free, densely papillose throughout. *Capsule* 3-coccous ; cocci 2-valved. *Seeds* globose ; endosperm fleshy.

Twining herbs ; leaves alternate, cordate at the base ; inflorescence a raceme, terminal or leaf-opposed, with numerous male flowers above and 1-2 basal female flowers.

Endemic ; species 2, extending from the northern Transvaal and Natal to George.

4421

28. PLUKENETIA, Linn.

Plants monœcious. *Male flowers* : *Calyx* 4-5-lobed ; lobes valvate. *Petals* 0. *Disc* 0. *Stamens* 8-30 (about 8-12 in the South African species) ; filaments free, inserted on a fleshy receptacle. *Pistil* rudimentary, or usually 0. *Female flowers* : *Calyx* 4-5-lobed ; lobes imbricate. *Petals* 0. *Disc* 0. *Ovary* normally 4-chambered, pilose in the South African species, with a single ovule in each chamber ; styles connate in a hollow cylindric or sub-globose fleshy column crowned by the free stigmatic lobes. *Capsule* 4-dymous in the South African species, breaking up into 2-valved cocci ; cocci dorsally winged. *Seed* globose or compressed, sometimes winged ; endosperm fleshy.

Slender twining, rarely erect or procumbent, herbs or undershrubs, rarely shrubs; leaves alternate, petioled, entire or toothed, 3-5-nerved from the base; inflorescence a leaf-opposed or axillary raceme, with the male flowers more or less glomerulate above and the female solitary towards the base of the raceme, sometimes casually absent.

Species about 12, found in most hot countries; 4 species found in tropical Africa; 2 species extend into South Africa, and recorded from the Transvaal and Bechuanaland.

4422

29. DALECHAMPIA, Linn.

Plants monœcious, those of the 2 sexes together, enveloped by two showy bracts. *Male flowers*: *Calyx* splitting into 4-6 valvate lobes. *Petals* 0. *Disc* 0. *Stamens* usually 20-30, rarely more or fewer; filaments united into a short or long column. *Pistil* 0. *Female flowers*: *Calyx* usually 6-partite, with the lobes more or less 2-seriately imbricate, or 5-partite, quincuncial, rarely more than 6-partite; segments pinnatifid or fimbriate, less often lanceolate and entire, often coriaceous and accrescent in fruit. *Petals* 0. *Ovary* 3- (rarely 4-) chambered, hirsute, or puberulous in the South African species, with a single ovule in each chamber; styles united into a long column; stigma capitate, small or dilated, entire or lobulate. *Capsule* 3-dymous, rarely 4-dymous, breaking up into 2-valved cocci. *Seeds* globose or ellipsoid; endosperm fleshy.

Twining or climbing undershrubs; leaves alternate, long-petioled, entire or 3-5-lobed or partite; inflorescence a sessile or peduncled axillary raceme usually congested and sub-capitate, surrounded by the two large veined and usually brightly-coloured simple or lobed involucre bracts.

Species about 60, spread throughout the warmer regions of both hemispheres, but most numerous in America; 4 species found in South Africa, extending from the Transvaal and Natal to the Uitenhage district; also recorded from Bechuanaland.

4424

30. RICINUS, Linn.

Plants monœcious. *Male flowers*: *Sepals* splitting into 3-5 valvate segments. *Petals* 0. *Disc* 0. *Stamens* very numerous; filaments connate in repeatedly branching clusters. *Pistil* 0. *Female flowers*: *Calyx* normally spathaceous, very caducous. *Petals* 0. *Disc* 0. *Ovary* 3-chambered, with a single ovule in each chamber; styles more or less plumose, 2-fid, or 2-partite, or occasionally entire. *Capsule* 3-dymous, breaking up into three 2-valved cocci. *Seeds* ovoid-oblong, carunculate; endosperm fleshy.

A tall glabrous annual, in the warmer regions a perennial shrub or small tree; leaves large, alternate, peltate, palmately 7-13-lobed; inflorescence a raceme, more or less paniculate at the ends of the branches, with the male flowers uppermost and crowded, and the female flowers below and shortly pedicelled.

Species 1; naturalised in South Africa and widely spread.

4433

31. JATROPHA, Linn.

Plants monœcious, rarely dicecious. *Male flowers*: *Sepals* 5, imbricate, often slightly connate below. *Petals* 5, free or connate below into a tube, rarely obsolete. *Disc* of 5 free glands, sometimes annular. *Stamens* 8 (in the South African species), in two series; filaments connate below. *Pistil* 0. *Female flowers*: *Sepals* as in the male. *Petals* as in the male. *Disc* of 5 free glands, often annular. *Ovary* glabrous or hirsute, 2-3- (rarely 4-5-) chambered, with a single ovule in each chamber; styles connate below, often shortly 2-partite. *Capsule* ovoid or sub-globose, breaking up into 2-5, usually 3, two-valved cocci. *Seeds* carunculate; caruncle often deeply lobed; endosperm fleshy.

Herbs, often with a thick perennial rootstock, or shrubs; leaves alternate, occasionally clustered, entire, or digitately, rarely pinnately, lobed; stipules setaceously lobed or partite, rarely rigid and spiny; inflorescence a terminal dichotomous cyme; the female flowers solitary, terminal; the male flowers lateral.

Species about 160, generally distributed throughout the tropics and extending beyond the tropics into North America; 11 species found in South Africa, extending from the Transvaal and Natal to the Uitenhage district, but also recorded from Bechuanaland and the Jansenville district.

4439

32. CEPHALOCROTON, Hochst.

Plants monœcious. *Male flowers*: *Calyx* splitting into 3-4 valvate lobes. *Petals* 0. *Disc* 0. *Stamens* 6-8; filaments free, 2-seriate. *Pistil* rudimentary, columnar, short, entire or 2-3-lobed. *Female flowers*: *Sepals* 5-6, unequal, pinnatifid. *Petals* 0. *Disc* annular. *Ovary* 3-chambered, finely pubescent (in the South African species), with a single ovule in each chamber; styles connate below, free and multifid above. *Capsule* 3-coccus; cocci 2-valved.

Shrubs, with stellate hairs; leaves alternate; stipules small, lacinulate; inflorescence a terminal raceme, androgynous; the male flowers aggregated in an apical peduncled sub-globose head; the female flowers basal, long-pedicelled.

Species 8, all African; 1 species occurs in the northern Transvaal.

4448

33. CLUYTIA, Linn.

Plants diœcious, very rarely monœcious. *Male flowers*: *Sepals* 5. *Petals* usually almost as long as the sepals, clawed, with one or more glands at the base within. *Disc* of free lobulate glands at the base of the sepals. *Stamens* 5; filaments connate. *Pistil* rudimentary, surrounded and supported by the connate filaments. *Female flowers*: *Sepals* 5. *Petals* as in the male. *Disc* as in the male. *Ovary* 3-chambered, glabrous, hairy, or wart-punctate, with a single ovule in each chamber; styles free or shortly connate at the base, 2-fid or 2-lobed. *Capsule* sub-globose, breaking up septically into three entire or 2-fid valves. *Seeds* ovoid, carunculate; endosperm fleshy.

Shrubs or undershrubs; leaves alternate, entire; male flowers pedicelled, in axillary fascicles; female flowers with longer pedicels and often solitary.

An African genus of about 60 species; 37 species found in South Africa, extending from the Transvaal and Natal through the coastal belt to Clanwilliam; also found in S.W. Africa and a few of the north-eastern districts; rare in the central districts.

4464

34. GELONIUM, Roxb.

Plants diœcious, rarely monœcious. *Male flowers*: *Sepals* 5, rarely 6, often unequal, imbricate in bud. *Petals* 0. *Receptacle* glandular, or if eglandular then with a small extra-staminal disc. *Stamens* 6-60 (8 or 12-14 in the South African species); filaments free. *Pistil* 0. *Female flowers*: *Sepals* 5, imbricate, narrower than in the male. *Petals* 0. *Disc* with a membranous margin, sometimes bearing very rudimentary staminodes. *Ovary* 2-3-chambered, with a single ovule in each chamber; styles 2-3, shortly 2-fid or lacerate. *Fruit* globose or 3-dymous, capsular or drupaceous, 3- or 2-locular, or by abortion 1-locular, indehiscent, or at length opening loculicidally or breaking up into 2-3-cocci.

Trees or shrubs; leaves alternate, entire or toothed, gland-dotted; stipules connate, very caducous; flowers in leaf-opposed sessile or sub-sessile cymose glomerules.

Species about 18, widely spread in the tropics of the eastern hemisphere from East and South Africa to India, Malaya, and New Guinea; 2 species found in South Africa, extending from Natal to the Uitenhage district; also found in the Somerset East district.

4478

35. SPIROSTACHYS, Sond.

Plants monœcious. *Male flowers*: *Calyx* usually 5- (rarely 4-) lobed. *Petals* 0. *Disc* 0. *Stamens* 3; filaments united throughout into a slender tube. *Pistil* 0. *Female flowers*: *Calyx* 5-lobed. *Petals* 0. *Disc* 0. *Ovary* 3- (rarely 2-) chambered, with a single ovule in each chamber; styles 3, rarely 2, distinctly connate below, entire. *Capsule* 3-cocccous, rarely 2-cocccous. *Seeds* globose; endosperm fleshy.

Trees or shrubs; leaves alternate; inflorescence of lateral catkin-like spikes, with numerous male flowers above and a few basal female flowers, occasionally with the basal female flowers wanting.

Species 1, rather widely spread in Africa to the south of latitude 12 degrees South; recorded from the Transvaal and Natal.

4483

36. SAPIUM, P.Br.

Plants monœcious, rarely diœcious. *Male flowers*: *Calyx* usually 3-lobed. *Petals* 0. *Disc* 0. *Stamens* 2-3; filaments free. *Pistil* 0. *Female flowers*: *Calyx* 2-3-lobed. *Petals* 0. *Disc* 0. *Ovary* 3-chambered, rarely 2-chambered, with a single ovule in each chamber; styles 3, rarely 2, free or slightly connate below, entire. *Capsule* 3-coccus, rarely 2-coccus; cocci 2-valved, rarely sub-indehiscent. *Seeds* globose or narrow-oblong; endosperm fleshy.

Trees or shrubs; leaves alternate; inflorescence a terminal androgynous spike, with numerous male flowers above and a few basal female flowers.

Species about 100, widely spread in all tropical regions; 3 species found in South Africa, extending from Natal to the Albany district.

4485

37. MAPROUNEA, Aubl.

Plants monœcious. *Male flowers*: *Calyx* shortly 2-3-lobed. *Petals* 0. *Disc* 0. *Stamens* 1-3, usually 2, exserted; filaments united below, free above. *Pistil* 0. *Female flowers*: *Calyx* 3-lobed. *Petals* 0. *Disc* 0. *Ovary* 3-chambered, with a single ovule in each chamber; style connate into a short column below, free above, entire. *Capsule* sub-globose or slightly 3-angled; cocci 2-valved. *Seeds* obovoid, with a large fleshy caruncle; endosperm fleshy.

Trees or shrubs; leaves alternate; inflorescence a spike, terminating specialised contracted twigs, with the male flowers in a dense ovoid or sub-globose head, and with usually 1-3 pedicelled female flowers at the base; male bracts glandular at the base on each side, 3-5-flowered; female bracts 1-flowered.

Species 5; 2 found in America and 3 in tropical Africa, one of the latter species extends as far as Delagoa Bay.

4498

38. EUPHORBIA, Linn.

Apparent flower consisting of a number of stamens (really male flowers, each consisting of a single stamen jointed to a pedicel and soon falling away from it, without or rarely with a minute calyx just above the articulation), mingled with membranous or woolly scales or bracteoles, with or without a stalked or sessile ovary (really a female flower, with or without a minute 3-lobed, or very rarely cup-like, or tubular calyx at the base of the ovary, but without a tubular involucre surrounding the pedicel) in their midst, contained in a calyx-like cup-shaped involucre, the whole resembling a small bisexual or male flower. *Involucre* a cup, with an outer series of 2-8 (usually 4-5) glands; glands distinct and equally spaced or very rarely united, entire, petal-like, 2-horned, or divided into teeth or processes

on the outer margin, alternating with an inner series of 4-8 (usually 5) membranous erect or inflexed entire or toothed lobes. *Anthers* 2-theccous, with the thecae more or less diverging. *Ovary* wholly or partly included or exserted, 3- (rarely 2-) chambered, with a single pendulous ovule in each chamber; styles 3, rarely 2, free or more or less united, but rarely united to the apex, entire or bifid at the tips. *Fruit* a 3- (rarely 2-) locular capsule; loculi separating at maturity from the central persistent axis and opening along their inner face into 2 valves. *Seeds* usually carunculate at the hilum; embryo straight, with flat cotyledons, enclosed in a thick endosperm.

Herbs, shrublets, shrubs, or trees, very variable in habit, leafy or leafless, often succulent or cactus-like, with copious milky juice; leaves alternate, or the upper or all opposite, entire, toothed, or rarely lobed; stipules present or absent, in some of the succulent plants often transformed into prickles or spines above a pair of larger spines; involucre solitary and terminal or axillary, or in the forks of the stems, or in axillary or terminal clusters or cymes or umbels, which are simple or compound, paniculate, racemously arranged along the branches in pairs, or rarely whorled, very rarely in axillary racemes or arising immediately behind the base of large solitary spines.

Species about 1,000, dispersed throughout the warmer and temperate regions; over 180 species found in South Africa, widely distributed.

4498a

39. ELAEOPHORBIA, Stapf

Floral structure exactly as in *Euphorbia*, from which it only differs by its fruit as follows: *Fruit* indehiscent, with a thick flesh enclosing a hard bony 3-locular "stone", marked with a slender groove down each of the 3 very obtuse angles, and with a pore on each face near the apex between the grooves, also, when separated from the flesh, there is an opening at the base. *Seed* solitary in each loculus, sometimes abortive in one or two of the loculi; endosperm copious, somewhat fleshy.

Trees, with succulent angular branches; leaves alternate, fleshy, entire, with a pair of spines at their base; peduncles axillary, simple, or once or perhaps twice forked.

Species 2, 1 doubtfully recorded from the Transvaal, and 1 in West Africa.

4500

40. SYNADENIUM, Boiss.

Apparent flower consisting of an entire shallow cup- or saucer-like involucre, with a very spreading or more rarely erect rim-like gland outside of, and completely surrounding an inner series of 5 inflexed-erect membranous sub-quadrate fringe-toothed lobes; gland usually entire, occasionally having a cut-like notch on one side, or divided by 2-5 cut-like notches into unequal or equal segments, but not forming equally-spaced separate glands. *Stamens* (really male flowers without a perianth, as in *Euphorbia*) arranged in 5 groups contained in 5 compartments with membranous walls, opposite the lobes of the involucre. *Ovary* (really a female flower with the perianth reduced to a rudimentary rim of 3 minute or rarely well-developed conspicuous lobes, as in *Euphorbia*) stalked, often absent, when present then 3-chambered, with a single ovule in each chamber, with the pedicel surrounded by a membranous tube; tube lobed and fringed at the top; styles 3, united at the basal part; stigmas bifid, rarely entire.

Shrubs or small trees, with the young branches fleshy, full of milky juice; leaves alternate, entire, more or less fleshy; stipules 0; inflorescence axillary; cymose, cymoso-paniculate, or umbel-like, with a pair of free persistent or deciduous bracts at the base of each involucre, and not or scarcely exceeding its rim-like gland.

A tropical African genus of 13 species; 1 species occurs in Natal.

99. CALLITRICHACEÆ.

Flowers unisexual. *Male flowers*: *Perianth* 0. *Stamen* 1; filaments filiform, elongated; anther 2-theous. *Female flowers*: *Perianth* 0. *Stamens* 0. *Ovary* sessile or shortly stalked, 4-furrowed and lobed, 4-chambered, with a solitary pendulous ovule in each chamber; styles 2, elongated, papillose on either side. *Fruit* compressed, leathery, indehiscent, 4-lobed, 4-locular, with the lobes dorsally margined or winged, 4-seeded. *Seeds* pendulous; embryo terete; endosperm fleshy.

Small terrestrial or aquatic herbs; leaves opposite, small, linear or obovate-spathulate, entire; flowers minute, axillary, solitary, very rarely a male and female flower from the same leaf-axil forming an apparently bisexual flower; bracteoles linear-oblong, membranous, caducous.

Genus 1; species 15; cosmopolitan.

4530

1. CALLITRICHE, Linn.

Characters of the family.

2 species in South Africa, recorded from Natal and the Albany, Uitenhage, and Clanwilliam districts.

100. BUXACEÆ.

Plants monœcious or diœcious. *Flowers* unisexual, rarely a few bisexual. *Male flowers*: *Sepals* usually 4, sometimes 6 or 0, usually in 2 series, imbricate. *Petals* 0. *Stamens* 4 or 6, rarely more, when 4 then opposite the sepals, when 6 then 2 pairs opposite the inner sepals; filaments free, sometimes 0; anthers large. *Pistil* present or absent. *Female flowers*: *Sepals* as in the male. *Ovary* superior, 3-chambered, with 1-2 pendulous inverted ovules in each chamber; styles 3, free, short, thick, undivided, persistent in the fruit. *Fruit* a loculicidal capsule, often 2-horned, or a drupe. *Seeds* black and shining; cotyledons flat, thick; endosperm fleshy.

Trees or shrubs, rarely herbs, without milky juice; leaves opposite (in the South African species) or alternate, entire; stipules 0; inflorescence a sessile or shortly peduncled raceme, spike, or cyme, or the flowers fasciated; flowers sessile or shortly pedicelled; the terminal usually female; the remainder male.

Genera 7; species about 33, natives of Africa, the Malay Archipelago, America, and Japan.

Stamens 4 1. *Buxus*, Linn.
Stamens 6 2. *Notobuxus*, Oliv.

4533

1. BUXUS, Linn.

Plants monœcious. *Disc* 0. *Male flowers*: *Calyx* 4-lobed; segments imbricate, in 2 series. *Stamens* 4, opposite the perianth-segments; filaments absent (in the South African species) or present, free. *Pistil* 0, or rudimentary. *Female flowers*: *Calyx* 4-6-lobed; lobes strongly imbricate; the outer smaller. *Ovary* 3-chambered, with 2 pendulous ovules in each chamber; styles usually distant from one another. *Capsule* ovoid, loculicidal; valves 2-horned, tipped with the persistent styles. *Seeds* oblong or ellipsoid, usually black; endosperm rather fleshy.

Much-branched trees or shrubs; leaves opposite, shortly petioled, entire; inflorescence a sessile or shortly peduncled axillary raceme or cyme; flowers sessile or shortly pedicellate; the terminal one female, the remainder male; bracts resembling the sepals.

Species about 21, found in the Northern Hemisphere, tropical Africa, Madagascar, and west India; 1 species occurs in South Africa, found in the Kingwilliamstown and East London districts.

4534

2. NOTOBUXUS, Oliv.

Plants monœcious. *Male flowers*: *Sepals* 4, in two series. *Stamens* 6, in two series; anthers sessile. *Pistil* 0. *Female flowers*: *Sepals* 4. *Ovary* 3-chambered, with 2 pendulous ovules in each chamber; styles 3, divergent. *Fruit* capsular, dehiscent loculicidally; valves 2-horned. *Seeds* oblong, keeled, black and shining.

Small trees or shrubs; leaves opposite, entire, shortly petiolate; inflorescence a short cyne, with the terminal flower female and the lateral flowers male, or flowers sub-fasciculate.

Species 2, 1 found in tropical Africa and 1 in South Africa, the latter extends from Natal to the Transkei.

101. ANACARDIACEÆ.

Plants sometimes diceious, or with occasional bisexual flowers. *Flowers* bisexual or unisexual, very often regular. *Calyx* 3-7-fid or -partite, rarely spathaceous or irregularly ruptured. *Petals* 3-7, rarely 0, usually free. *Disc* often annular, rarely stalked or of separate glands. *Stamens* very often twice the number of the petals, rarely as many, very rarely indefinite; filaments free, rarely adnate to a torus; anthers very often versatile. *Ovary* superior, 1-5-chambered, with usually 1 ovule pendulous from a basal funicle or from the apex of the chamber, rarely with 2-3 ovules in each chamber; style 1 or styles 3. *Fruit* usually a drupe, sometimes winged. *Seed* erect, horizontal, or pendulous; cotyledons often fleshy; endosperm 0, or thin.

Shrubs or trees, often with resinous bark; leaves alternate, very rarely opposite, simple, pinnate, or 3-foliate; stipules 0, rarely rudimentary; inflorescence, at least in the South African genera, usually a panicle.

Genera 66, with over 500 species, found in all tropical and warm countries.

Tribe **Mangifereæ**: Carpels 5, free, sometimes carpel only 1; leaves simple, entire. (genus 1).

Tribe **Spondiæ**: Carpels united to form a single ovary, mostly 5-4, seldom 3-chambered; each carpel forming 1 chamber of the ovary; ovule solitary, pendulous in each chamber; leaves pinnate (in the South African species) (genera 2-4).

Tribe **Rhoideæ**: Carpels 3, united to form a single ovary, which is sometimes 1-chambered with a single ovule; 2 chambers very small or wanting; leaves pinnate, 3-foliate, or simple. (genera 5-11).

1. Leaves simple	2
Leaves compound	6
2. Stamens more than the number of petals	3
Stamens as many as the petals	4
3. Filaments connate	1. <i>Anacardium</i> , Linn.
Filaments free	10. <i>Heeria</i> , Meissn.
4. Leaves opposite or sub-opposite	5. <i>Protorhus</i> , Engl.
Leaves alternate	5
5. Leaves coarsely serrated	8. <i>Laurophyllus</i> , Thunb.
Leaves entire, penninerved	10. <i>Heeria</i> , Meissn.
6. Leaves 3-foliate	7
Leaves pinnate	8
7. Ovule pendulous	9. <i>Smodingium</i> , E. Mey.
Ovule basal	11. <i>Rhus</i> , Linn.
8. Stamens as many as the petals	7. <i>Loxostylis</i> , Spreng.
Stamens more than the number of the petals	9

9. Leaflets abruptly acuminate 2. *Sclerocarya*, Hochst.
 Leaflets often acuminate, but not abruptly acuminate 10
 10. Fruit bearing the 4 persistent small distant styles 4. *Lannea*, A. Rich.
 Fruit not bearing the persistent styles 11
 11. Leaves crowded at the apex of the branches ; leaflets unequal-sided
 3. *Harpephyllum*, Bernh.
 Leaves not crowded at the apex of the branches : leaflets not
 unequal-sided 6. *Schinus*, Linn.

4546

1. ANACARDIUM, Linn.

Flowers bisexual, with occasional unisexual flowers on the same plant. *Calyx* 5-partite, imbricate, deciduous. *Petals* 5, linear, recurved, imbricate. *Stamens* 8-10, unequal, all or a few fertile ; filaments connate among themselves and with the stalked receptacle. *Ovary* rudimentary in the male ; in the female sessile, obovate or obovate, 1-chambered, with a single lateral ovule ; style filiform ; stigma pointed. *Fruit* an oblique reniform nut, supported upon a fleshy pear-shaped enlargement of the torus and pedicel. *Seed* reniform ; embryo with semi-lunar cotyledons and a hooked radicle.

Shrubs or trees ; leaves alternate, simple, petioled, entire ; inflorescence a terminal panicle of corymbose racemes ; bracts present.

Species 9, natives of tropical America, especially Brazil. The occurrence of this genus in South Africa, even under cultivation, except at Delagoa Bay, is somewhat doubtful.

4558

2. SCLEROCARYA, Hochst.

Flowers bisexual, with occasional unisexual flowers on the same plant. *Sepals* 4, orbicular, coloured, imbricate. *Petals* 4, oblong, obtuse, much longer than the sepals, imbricate. *Disc* depressed, entire. *Stamens* in the male flowers 12-20, in the female flowers fewer and mostly without anthers ; filaments swollen at the base. *Ovary* 2-3-chambered, with 1 pendulous ovule in each chamber ; styles 2-3, distant, short, thick ; stigmas peltate. *Fruit* a fleshy drupe ; 2-3-locular. *Seed* solitary in each loculus, pendulous ; cotyledons thick, plano-convex ; endosperm 0.

Trees or shrubs ; leaves crowded at the apex of the branches, alternate, imparipinnate ; leaflets petioled, entire, acuminate in the South African species ; inflorescence a spike.

Species 5, all African ; 2 species in South Africa, found in the Transvaal, Natal, and S.W. Africa.

4562

3. HARPEPHYLLUM, Bernh.

Plants diœcious. *Male flowers* : *Calyx* 4-5-cleft. *Petals* 4-5, free. *Stamens* 8 or 9 ; filaments free. *Disc* crenate. *Rudimentary pistil* present. *Female flowers* not seen. *Fruit* an obovate smooth sub-fleshy drupe. *Seeds* with fleshy cotyledons.

A tall glabrous tree ; leaves alternate, crowded at the ends of the branches, petioled, imparipinnate ; leaflets falcate-lanceolate, entire, unequal-sided ; male flowers in a terminal panicle.

Endemic ; species 1, found in the Transvaal, Natal and the eastern districts to the Uitenhage district.

NOTE.—This plant has been placed under *Lannea* ; the fruits of *Lannea* however, with the persistent styles, at once enable one to distinguish this genus from *Harpephyllum*, and though I have not examined female flowers of the latter I prefer, for the present, to keep the two genera distinct.

4563

4. LANNEA, A. Rich.

(Odina, Roxb.)

Flowers bisexual, with occasional unisexual flowers on the same plant, *Calyx* shortly 4-lobed, persistent. *Petals* 4, rarely 6, oblong, concave, spreading, imbricate. *Disc* annular, fleshy, 8-crenate. *Stamens* 8, inserted below the margin of the disc; filaments free; anthers ovate. *Ovary* in the male 4- (rarely 6-) partite; in the female 1-chambered, with a solitary pendulous ovule; styles 4; stigmas simple. *Fruit* a drupe, crowned with the remains of the styles. *Seed* pendulous; embryo slightly curved.

Trees, rarely acaulescent; leaves alternate, pinnate; leaflets opposite; flowers small, fascicled in simple or paniced terminal racemes.

Species about 65, natives of Africa and India; 4 species in South Africa, found in the Transvaal, Natal, and S.W. Africa.

4576

5. PROTORHUS, Engl.

Plants sometimes dioecious, with occasional bisexual flowers. *Flowers* bisexual or unisexual. *Calyx* 5-partite. *Petals* 5, erect, imbricate. *Disc* thick, urceolate in the male flowers. *Stamens* 5, inserted below the disc; filaments subulate; anthers short. *Ovary* ovoid, 3-chambered or 1-chambered by abortion, with a solitary pendulous ovule in each chamber; stigmas 3, sessile, obovate, connate at the base. *Fruit* a drupe, 1-locular, 1-seeded. *Seeds* oblong; cotyledons flat; endosperm 0.

Trees or shrubs; leaves opposite or sub-opposite, simple, oblong or obovate-oblong, with numerous lateral veins; flowers small; inflorescence a small axillary, or larger terminal, panicle.

Species 11, natives of Africa and Madagascar; 2 species in South Africa, found in the Transvaal, Natal, the Transkei, and Namaqualand.

4582

6. SCHINUS, Linn.

Plants dioecious. *Calyx* short, 5-partite, with imbricated lobes. *Petals* 5, imbricated. *Disc* annular. *Stamens* 10, inserted on the disc; filaments subulate. *Ovary* sessile, 1-chambered, with a solitary pendulous ovule; styles 3; stigmas capitate. *Fruit* a small round drupe. *Seed* compressed, pendulous; cotyledons flat; endosperm somewhat fleshy.

Large or small trees; leaves alternate, imparipinnate; leaflets opposite or alternate; inflorescence a small axillary and terminal panicle.

Species 12, natives of South America; 1 species cultivated in South Africa.

4586

7. LOXOSTYLIS, Spreng.

Plants dioecious. *Male flowers*: *Calyx* deeply 5-parted; lobes acuminate, coloured. *Petals* 5, 3 times as long as the calyx, clawed, acuminate, imbricate. *Disc* of 5 scales. *Stamens* 5, free, unequal, inserted between 5 glandular scales in the tube of the calyx. *Pistil* 0. *Female flowers*: *Calyx* 3-parted; lobes linear-oblong, pale green, veined. *Petals* minute. *Ovary* ovate, oblique, 1-chambered, with a single basal ovule; styles 1-4; stigmas capitate. *Fruit* a dry drupe, rugose, oblique, 1-locular, 1-seeded, included in the persistent calyx. *Seed* compressed; cotyledons fleshy; endosperm 0.

A tree; leaves alternate, petioled, imparipinnate, 2-6-jugate; leaflets opposite, sub-sessile, lanceolate; rhachis winged; inflorescence a terminal panicle.

Endemic; species 1, extending from Natal to the Uitenhage district.

4587

8. LAUROPHYLLUS, Thunb.

(Botryceras, Willd.)

Plants dioecious. *Male flowers*: *Calyx* 4-5-cleft nearly to the base, imbricate. *Petals* 4-5, lanceolate, shorter than or as long as the sepals, reflexed-spreading. *Disc* fleshy, expanded. *Stamens* 4-5, exserted, alternating with the calyx-segments; anthers versatile, gibbous. *Pistil* 0. *Female flowers*: *Calyx* and *petals* as in the male, persistent. *Ovary* 1-chambered, with a single pendulous ovule; style simple, from the upper margin of the ovary; stigma 3-lobed. *Fruit* a small drupe, compressed, winged on the margin, tipped with the permanent sub-lateral style. *Seed* without endosperm; cotyledons flat-convex.

A tree or large shrub, resinous; leaves alternate, simple, petioled, elliptic-oblong, serrated; flowers small; inflorescence a terminal panicle; male panicle lax; female panicle very dense.

Endemic; species 1, extending from Swellendam to the Uitenhage district.

4588

9. SMODINGIUM, E.Mey.

Flowers bisexual, with occasional unisexual flowers on the same plant. *Calyx* 5-cleft, persistent. *Petals* 5, oblong, deciduous. *Disc* small, annular. *Stamens* 5, opposite the calyx-lobes; filaments subulate; anthers ovate, 2-theous. *Ovary* 1-chambered, with a single pendulous ovule; styles 3, persistent, short; stigmas obtuse. *Fruit* sub-orbicular, with the margins winged, oblique, with oil ducts on both sides. *Seed* solitary; radicle hooked; endosperm 0.

A glabrous shrub; leaves alternate, petioled, 3-foliolate; leaflets lanceolate, coarsely toothed; flowers small; inflorescence a terminal panicle.

Endemic; species 1, found in the Transkei, Pondoland, and Natal.

4589

10. HEERIA, Meissn.

(Anaphrenium, E.Mey.)

Plants dioecious, with occasional bisexual flowers. *Calyx* of 5 segments. *Petals* 5. *Disc* saucer-shaped, 5-lobed. *Stamens* 5, rarely 10. *Ovary* 1-chambered, with a single basal ovule; style simple, with 3 stigmas, or styles 3. *Fruit* a dry or sub-fleshy drupe. *Seed* pendulous from a basal funicle; cotyledons leafy or fleshy; endosperm 0.

Shrubs or small trees; leaves alternate, simple, penninerved; flowers small; inflorescence a terminal panicle, longer or shorter than the leaves.

Species 18, all African; 8 species in South Africa, extending from the Transvaal and Natal to the Paarl district; also found in S.W. Africa.

4594

11. RHUS, Linn.

Plants sometimes (mostly in the South African species) dioecious, with occasional bisexual flowers. *Flowers* sometimes all bisexual. *Calyx* small, 5-6-partite, persistent. *Petals* 5-6, oblong or ovate, spreading. *Disc* usually almost 5- or 10-lobed. *Stamens* 5-6, perfect, or in female flowers represented by staminodes. *Ovary* (a rudimentary pistil in male flowers) 1-chambered, with a solitary basal ovule; style simple, with 3 stigmas, or styles 3, free. *Fruit* a nearly dry drupe, or in the South African species, often with a juicy mesocarp which however dries up. *Seed* pendulous from a basal funicle; cotyledons leafy or fleshy; endosperm 0.

Shrubs or small trees; leaves alternate, 3-foliolate; inflorescence an axillary or terminal panicle or raceme, longer or shorter than the leaves.

Species about 234, natives of most tropical and sub-tropical countries; over 60 species described from South Africa, widely distributed.

102. AQUIFOLIACEÆ.

Flowers regular, bisexual or unisexual. *Calyx* 3-6-partite or 4-toothed, imbricate, persistent. *Petals* 4-5, rarely more, free or connate, imbricate. *Disc* 0, or adhering to the ovary. *Stamens* as many as the petals, rarely more, free or adhering to the petals; filaments subulate; anthers oblong-cordate. *Ovary* superior, 3-4-5- (rarely many-) chambered, with 2 (or 1) pendulous ovules in each chamber; style 0 or terminal; stigma discoid, capitate, or 4-toothed. *Fruit* a drupe or a 4-locular capsule, 1-seeded, or with 1 seed in each loculus of the capsule. *Seed* pendulous; embryo straight; endosperm copious, fleshy.

Shrubs or trees, often with watery juice; leaves alternate, petioled, simple, often entire; stipules 0; flowers small; inflorescence an axillary and terminal cyme, or axillary panicle, rarely flowers solitary or fascicled in the axils of the leaves.

Genera 4; species nearly 300, mostly found in Asia and tropical America.

4614

1. ILEX, Linn.

Flowers bisexual. *Calyx* small, 4-6-toothed, persistent. *Corolla* rotate, 4-6-parted, with obtuse imbricated segments. *Stamens* in the corolla-throat, as many as the corolla-lobes and alternating with them; filaments subulate; anthers opening by longitudinal slits. *Ovary* sessile, 4-6-chambered, with the ovules in pairs (or solitary) in each chamber; style 0 or short; stigmas 4-6. *Fruit* a globose drupe, crowned with the persistent stigmas. *Seed* inverted; embryo minute; endosperm fleshy.

Trees or shrubs; leaves entire or toothed, often shining; flowers in few-flowered axillary peduncles which are often branched.

Species about 200, mostly natives of America and Asia; 1 species found in South Africa; extends from the Cape to Natal and the Transvaal.

103. CELASTRACEÆ.

Flowers bisexual or unisexual. *Calyx* 4-5-partite; segments entire or cut, imbricate, persistent. *Petals* 4-5, free, deciduous. *Disc* fleshy, 4-5-lobed or entire, more or less surrounding, or at times partially enveloping, the ovary. *Stamens* 4-5, inserted under or on the edge of the disc; filaments often dilated at the base, usually short; anthers erect, basi- or dorsifixed, opening by longitudinal slits. *Ovary* superior, but sometimes partially sunk in the disc, 1-5-chambered, with usually 2, sometimes 3-6, erect or pendulous ovules in each chamber; style thick; stigma 2-5-lobed. *Fruit* a capsule, berry, or drupe. *Seed* with or without an arillus; embryo axile; endosperm present or absent.

Trees or shrubs, sometimes twining, armed or unarmed; leaves opposite or alternate, simple, entire or toothed; stipules small, mostly caducous; inflorescence an axillary cyme or fascicle, very rarely a raceme.

Genera 40; species over 400, widely spread, except in the frigid zone, frequent in the tropics, less frequent in the temperate regions.

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|--|------------------------------------|
| 1. Leaves alternate | 2 |
| Leaves opposite | 5 |
| 2. Fruit winged or horned | 4, <i>Pterocelastrus</i> , Meissn. |
| Fruit not winged nor horned | 3 |
| 3. Ovary with 3-6 ovules in each chamber | 2, <i>Putterlickia</i> , Endl. |
| Ovary with 2 ovules in each chamber | 4 |

- | | |
|--|---------------------------------------|
| 4. Fruit a capsule | 1. <i>Gymnosporia</i> , Wight & Arn. |
| Fruit a drupe | 5. <i>Cassine</i> , Linn. |
| 5. Style lateral in fruit ; ovary 1-chambered | 8. <i>Pleurostylia</i> , Wight & Arn. |
| Style terminal in fruit ; ovary more than 1-chambered | 6 |
| 6. Fruit a capsule | 3. <i>Catha</i> , Forsk. |
| Fruit a dry or fleshy drupe | 7 |
| 7. Ovules pendulous | 6. <i>Maurocenia</i> , Linn. |
| Ovules erect | 8 |
| 8. Inflorescence a raceme | 9. <i>Lauridia</i> , E. & Z. |
| Inflorescence a cyme | 9 |
| 9. Seed without endosperm ; disc deeply 4-lobed | 7. <i>Hartogia</i> , Thunb. |
| Seed with endosperm ; disc collar-like, saucer-shaped, or flat | 5. <i>Cassine</i> , Linn. |

4627

1. GYMNOSPORIA, Wight & Arn.

(under *Celastrus*, Linn.)

Sepals 5, sometimes unequal, acute, obtuse, sometimes acuminate, with entire deeply-laciniated or fimbriated margins. *Petals* oblong to sub-orbicular, with the margins entire ciliated or undulate. *Disc* deeply 5-lobed, sometimes 5-sided, collar-like or saucer-shaped, with crenate or undulate margins. *Ovary* 2-4-chambered, with 2 ovules in each chamber ; style usually short ; stigma 2-4-lobed. *Fruit* a capsule. *Seeds* often with an aril.

Trees or shrubs ; leaves alternate, often tufted, acute or obtuse, cuneate or rounded at the base, entire or serrated, sometimes with revolute margins ; flowers solitary, fascicled, or in cymes ; pedicels often articulated.

Species over 100, in almost all tropical and sub-tropical countries ; 38 species in South Africa, generally distributed.

4628

2. PUTTERLICKIA, Endl.

Sepals 5, unequal, with laciniated margins ; the 2 outer smaller than the 3 inner. *Petals* oblong or obovate, with ciliated margins. *Disc* saucer-shaped, with a crenate margin and not enveloping the ovary, or fleshy and enveloping three-quarters of the ovary. *Ovary* 3-chambered, with 6 ovules in each chamber ; style terminal. *Fruit* a 3-angled capsule. *Seeds* partly covered with an aril ; endosperm present.

Glabrous shrubs, with strong spines which are either naked, or bear small tufts of leaves or undeveloped buds ; branches terete, greyish-brown, smooth or verrucose, with angular twigs ; inflorescence a lax or several-flowered cyme ; pedicels sometimes articulated.

Endemic ; species 2, extending from Malmesbury through the coastal belt to Natal and the Transvaal ; also found in Griqualand West and Somerset East.

4629

3. CATHA, Forsk.

(Methyscophyllum, E. & Z.)

Sepals 5, equal, deeply laciniated. *Petals* 5, oblong. *Disc* saucer-shaped, with a crenate margin. *Ovary* in the centre of the disc, but not enveloped by it, 3-chambered, with 2 erect ovules in each chamber ; style terminal ; stigma sub-sessile, 3-lobed. *Fruit* an oblong 3-locular capsule.

Glabrous unarmed shrubs, with terete branches and compressed glaucous twigs ; leaves opposite, petioled, lanceolate, leathery, with repand-serrate margins.

Species 1 ; extending from Knysna to Natal and the Transvaal ; found also in tropical Africa.

4630

4. PTEROCELASTRUS, Meisn.

Sepals 5, unequal, with laciniated margins. *Petals* 5, often brown-flecked. *Disc* fleshy, obsoletely 5-lobed and half enveloping the ovary. *Ovary* 3-chambered, occasionally 2-chambered, with 2 erect ovules in each chamber; style terminal; stigma usually 3-lobed, more rarely 2-lobed. *Fruit* a dry dehiscent capsule, with abrupt horns or wing-like outgrowths which may be variously divided.

Unarmed shrubs or trees, sometimes scandent, with brownish-grey terete branches and angular twigs; leaves alternate, petioled, lanceolate, oblong-lanceolate, elliptic-lanceolate, or obovate, obtusely-acuminate or obtuse, leathery, sometimes rugose on the under surface; inflorescence a lax or dense cyme.

Endemic; species 5, extending from Clanwilliam through the coastal belt to Natal and the Transvaal; also recorded from Somerset East.

4641

5. CASSINE, Linn.

(*Mystroxydon*, E. & Z., *Elacodendron*, Jacq., *Scytophyllum*, E. & Z.)

Sepals 4-5, usually fleshy, with laciniated margins. *Petals* 4-5, longer than the sepals, oblong or sub-orbicular. *Disc* fleshy, collar-like, saucer-shaped, or flat, either surrounding the base of the ovary or half enveloping it. *Ovary* 2-3-chambered, with 2 axile erect ovules in each chamber; style usually very short; stigma entire or 2-3-parted. *Fruit* a drupe. *Seed* without an aril; endosperm 0.

Unarmed trees or shrubs, sometimes twining, with terete and usually angular branches, sometimes with slightly winged twigs; leaves opposite or alternate, petioled, leathery; inflorescence a cyme.

Species over 50, found in Africa, Australia, Madagascar, and tropical America; 18 species in South Africa, extending from Malmesbury through the coastal belt to Natal and the Transvaal; also recorded from Somerset East.

4644

6. MAUROCENIA, Linn.

Sepals 5, equal. *Petals* 5, oblong, with slightly irregular margins. *Disc* saucer-shaped. *Ovary* 2-chambered, with 2 pendulous ovules in each chamber; stigma sub-sessile, 2-lobed. *Fruit* a somewhat fleshy drupe. *Seed* without an aril; endosperm 0.

An erect unarmed glabrous shrub, with grey terete branches and purplish angular twigs; leaves opposite, leathery, with entire hard-ridged revolute margins and a prominent thick midrib on the under surface; inflorescence a several-flowered cyme; peduncle short, stout; pedicels articulated.

Endemic; species 1, found in the south-western districts from Malmesbury to the Cape.

4645

7. HARTOGIA, Thunb.

Sepals 4, equal, with laciniated margins. *Petals* 4, oblong, with slightly laciniated margins. *Disc* fleshy, deeply 4-lobed. *Ovary* 2-chambered, with 2 ovules in each chamber; style very short; stigmas 2, bifid. *Fruit* fleshy when young, at length dry and indehiscent. *Seeds* without an aril; endosperm 0.

Small unarmed trees or shrubs, with grey branches and twigs; leaves opposite, petioled, leathery; inflorescence a somewhat lax cyme.

Species 2; 1 found in Madagascar, the other in South Africa, extending from Malmesbury to the Albany district.

4646

8. PLEUROSTYLIA, Wight & Arn.

(Cathastrum, Turcz.)

Sepals 5, equal. *Petals* 5, oblong or sub-orbicular, ciliolate, reflexed. *Disc* fleshy, flat, furrowed, with a crenate margin, surrounding the base of the ovary. *Ovary* 1-chambered, with 6-8 ovules on parietal placentas; style very short; stigma peltate, slightly lateral in the young state, distinctly lateral in the mature fruit. *Fruit* a dry 1-locular capsule curved on one side, with a scar half-way down one side showing the position of the style.

Large glabrous unarmed trees, with greyish-brown rough and fissured bark which contains a red pigment; twigs opposite, angular; leaves opposite, shortly petioled; inflorescence a few-flowered cyme.

Species 4; natives of India, Ceylon, Africa, Madagascar, and Mauritius; 1 species found in South Africa, extending from Zululand and Natal, to King-williamstown.

4647

9. LAURIDIA, E. & Z.

Sepals 4, equal. *Petals* 4, ovate. *Disc* obscurely lobed on the margin. *Ovary* half-immersed in the disc, 2-chambered, with 2 erect ovules in each chamber. *Fruit* a drupe. *Seed* with endosperm.

A glabrous unarmed shrub; leaves opposite, petioled, leathery; inflorescence a raceme.

Endemic; species 1, found in the Uitenhage and Albany districts.

NOTE.—*L. multiflora*, Engl., is *Salvadora persica*, Garcin.

104. HIPPOCRATEACEÆ.

Flowers perfect, regular, small, greenish-white. *Calyx* 4- or 5-parted, imbricate. *Petals* 4 or 5, sometimes larger than the calyx, imbricate or more rarely valvate. *Disc* conical, cupular, or broadly expanded, or minute. *Stamens* usually 3, sometimes 2 or 4 or 5, alternating with the petals; filaments free, sometimes connate at the base; anthers small or didymous. *Ovary* superior, often immersed in the disc, usually 3-chambered, with 2-10 ovules in 1-2 rows in each chamber; style short or 0; stigma 3-fid or 3-lobed, more rarely simple. *Fruit* capsular or fleshy. *Seed* compressed or angled, often winged; cotyledons thick; endosperm 0.

Small trees, or shrubs, or scandent; leaves opposite, more rarely alternate, simple, entire or toothed; stipules small or 0; flowers small; inflorescence an axillary panicle or cyme, usually much shorter than the leaves, rarely flowers solitary or 2-nate.

Genera 3; species about 190, natives of Africa, America, Madagascar, the Philippine Islands, and Hong Kong.

Climbing plants; fruit separating into 3 carpels 1. *Hippocratea*, Linn.

Plants not climbers; fruit fleshy 2. *Salacia*, Linn.

4661

1. HIPPOCRATEA, Linn.

Calyx small, 5-partite. *Petals* 5, spreading, larger than the calyx, valvate or imbricate. *Disc* conical, cupular, or broadly expanded. *Stamens* 3, very rarely 5 and 2-3 without anthers; filaments free or adnate to the ovary, dilated at the base, recurved or reflexed at the apex; anthers didymous, 2-4-theous; the thecae at length confluent. *Ovary* free or confluent with the disc, 3-chambered, with 2-6 ovules in 2 series in each chamber;

style short, subulate, 3-fid or 3-lobed. *Fruit* separating into 3 carpels, connate at the base, compressed, 2-valved or indehiscent. *Seeds* compressed, often winged below; cotyledons large, flattened.

Trees or climbing shrubs; leaves opposite, petioled, entire or toothed, with the petiole articulated at the base; stipules small, caducous; flowers small; inflorescence an axillary cyme or panicle; bracteoles 2.

Species about 114, distribution as in family; 2 species recorded from South Africa, found in the northern Transvaal and at Kentani in the Transkei.

4662

2. SALACIA, Linn.

Calyx small, deeply 4-5-parted. *Petals* 4-5, spreading, imbricate. *Disc* thick, expanded or conical, sinuate. *Stamens* 3, very rarely 2 or 4; filaments flattened, recurved; anthers small, 2-theous. *Ovary* half immersed in the disc, 3-chambered, with 2-4 or more ovules in 1-2 rows in each chamber; style short or long; stigma simple or 3-lobed. *Fruit* fleshy, 1-3-locular, with each loculus 1-4 seeded. *Seeds* (where known) large, angled; cotyledons thick.

Trees or shrubs; leaves opposite or alternate, entire or toothed; stipules 0; flowers small, on abbreviated axillary branchlets, fascicled or in cymes, rarely solitary or 2-nate, more rarely inflorescence a panicle.

Species about 150, occur in all tropical countries; 4 species in South Africa, found in the Transvaal, Natal, and S.W. Africa.

105. ICACINACEÆ.

Flowers regular, bisexual or unisexual, sometimes with a single perianth whorl. *Calyx* 4-5- (rarely 3-) toothed or lobed. *Petals* as many as the sepals, free or united at the base, imbricate or valvate. *Stamens* as many as the petals and alternating with them; filaments free or connate, sometimes hairy; anthers 2 theous. *Ovary* superior, 1- (rarely 3-5-) chambered, often hairy, with 2 (or 1) pendulous ovules; style simple or 0. *Fruit* a drupe. *Seed* pendulous; embryo usually small; endosperm present.

Trees or shrubs, rarely climbing; leaves alternate or opposite, simple, entire, toothed, or lobed; stipules 0; inflorescence various.

Genera 48; species about 180, natives of Africa, Madagascar, Australia, India, New Zealand, America, and the Malay Archipelago.

- | | |
|---|--------------------------------|
| 1. Leaves opposite | 1. <i>Cassinopsis</i> , Sond. |
| Leaves alternate | 2 |
| 2. Flowers bisexual, 5-merous | 2. <i>Apodytes</i> , E. Mey. |
| Flowers unisexual, usually 4-merous, with only 1 perianth whorl | 3. <i>Pyrenacantha</i> , Hook. |

4671

1. CASSINOPSIS, Sond.

Calyx 5-fid. *Corolla* 5-fid; segments oblong, sub-imbricate. *Stamens* 5, inserted on the base of the corolla; filaments subulate; anthers dehiscing by longitudinal slits. *Disc* 0. *Ovary* sessile, 1-chambered, with 2 (or 1) unequal pendulous ovules; style simple; stigma obscurely lobed. *Fruit* a nearly dry sub-globose drupe, apiculate, 1-locular, with 1 seed. *Seed* compressed; embryo minute; endosperm copious, fleshy.

A glabrous shrub; leaves opposite, simple; flowers minute; inflorescence an axillary dichotomous panicle.

Species 4, natives of Madagascar and South Africa; 2 species in South Africa, found in the forests from Swellendam to Natal, Zululand and the Transvaal; also recorded from Queenstown.

4686

2. APODYTES, E.Mey.

Calyx small, 5-toothed. *Petals* 5, free, or united at the base, valvate. *Stamens* 5, slightly cohering at the base with the petals; filaments somewhat thick; anthers oblong or linear. *Ovary* 1-chambered, with 2 pendulous ovules; style excentric or oblique, more or less incurved; stigma small. *Fruit* a fleshy drupe, obliquely-ellipsoid or orbicular. *Seed* pendulous; embryo small; endosperm fleshy.

Shrubs or trees; leaves alternate, simple, petioled, often shining; flowers small; inflorescence a terminal or axillary cymose corymb or panicle.

Species 17, mostly African, but 1 or 2 species found in Java and Indo-China; 1 species occurs in South Africa and found in the forest regions from Swellendam to Natal; also occurs in the Transvaal.

4709

3. PYRENACANTHA, Hook.

Plants dioecious. *Perianth* simple, 4-, rarely 3-5-, parted, valvate. *Male flowers*: *Stamens* 4, more rarely 3-5; *Ovary* rudimentary, gland-like. *Female flowers*: *Perianth* persistent, otherwise as in the male. *Stamens* 0. *Ovary* 1-chambered; stigma sessile, multiradiate, disc-like. *Fruit* a drupe.

Climbing shrubs; leaves alternate, entire, toothed, or lobed; flowers small; male inflorescence a long spike; female inflorescence a short oblong few-flowered or sub-capitate spike.

Species 15, all African; 1 species occurs in South Africa, recorded from George, East London, and Natal.

106. SAPINDACEÆ.

Plants often dioecious or monœcious, sometimes with occasional bisexual flowers. *Flowers* sometimes all bisexual, regular or asymmetric. *Calyx* usually with 5 free segments; segments imbricate, more rarely valvate. *Petals* usually 5 in the symmetrical flowers, sometimes 4, rarely 0, mostly with a scale or hairy on the inner face. *Disc* annular or unilateral, rarely absent or indistinct. *Stamens* usually inserted inside the disc, 4-24, usually 8; filaments included or exserted, often hairy, sometimes connate; anthers opening by longitudinal slits. *Ovary* superior, 2-8-, usually 3-, chambered, with 1-2, rarely 3, ovules in each chamber; style simple; stigma simple, more rarely lobed. *Fruit* a drupe or capsule. *Seed* usually solitary in each fruit-loculus; embryo usually curved; endosperm 0.

Trees or shrubs, rarely herbs or undershrubs; leaves alternate, usually compound, more rarely simple; stipules 0; inflorescence a raceme or panicle, more rarely flowers solitary or in clusters.

Genera 127; species over 1,000, mostly found in tropical and sub-tropical countries.

Sub-order Eusapindaceæ: Ovule solitary in each ovary-chamber, erect or ascending, with the micropyle downwards (genera 1-5).

Sub-order Dyssapindaceæ: Ovules usually 2 in each ovary-chamber, erect or pendulous, or several and horizontal, or rarely pendulous and solitary, with the micropyle upwards (genera 6-8).

1. A herbaceous climber, with the peduncle of the inflorescence ending in tendrils 1. *Cardiospermum*, Linn.
- Trees or shrubs 2
2. Sepals and petals present, very rarely the petals absent, but then sepals 4 and the ovary 2-chambered 3
- Petals absent 7. *Dodonæa*, Linn.

- | | |
|--|--|
| 3. Leaves simple | 4 |
| Leaves pinnate | 5 |
| 4. Sepals 4; ovary 2-chambered | 2. <i>Allophylus</i> , Linn. |
| Sepals 5; ovary 3-chambered | 5. <i>Pappea</i> , E. & Z. |
| 5. Sepals 4; disc unilateral | 2. <i>Allophylus</i> , Linn. |
| Sepals 5; disc annular | 6 |
| 6. Petals 4; fruit a membranous capsule | 6. <i>Erythrophysa</i> , E. Mey. |
| Petals 5; fruit more or less fleshy | 7 |
| 7. Leaf-rhachis evidently winged; stamens 8; ovary 3-chambered | 8. <i>Hippobromus</i> , E. & Z. |
| Leaf-rhachis not evidently winged; stamens 12-20, if only 6-10, then ovary 2-chambered | 8 |
| 8. Sepals strongly imbricate; stamens 12-20 | 3. <i>Deinbollia</i> , Schum. & Thonn. |
| Sepals narrowly imbricated; stamens 6-10 | 4. <i>Smelophyllum</i> , Radlk. |

4726

1. *CARDIOSPERMUM*, Linn.

Plants diœcious, with occasional bisexual flowers. *Flowers* irregular. *Sepals* 4, broadly imbricate; the 2 outer smaller. *Petals* 4, with internal unequal appendages. *Disc* unilateral, of 2 glands between the petals and stamens. *Stamens* 8; filaments unequal, free, or connate at the base. *Ovary* sessile or stalked, 3-chambered, with a solitary ovule in each chamber; style short, 3-fid, or styles free (in the South African species). *Fruit* a 2-3-locular bladdery capsule, with a single seed in each loculus. *Seeds* globose; cotyledons large.

Climbing herbaceous plants; leaves alternate, 3-foliate or decompound; leaflets toothed or cut, often dotted; inflorescence an axillary raceme or panicle; peduncle with a pair of tendrils at the summit, or with abortive pedicels.

Species about 23, mostly found in tropical America; 1 species occurs in South Africa and extends from the Kei River to Natal and the Transvaal; also found in S.W. Africa.

4734

2. *ALLOPHYLUS*, Linn.

(*Schmidelia*, Linn.)

Plants diœcious, with occasional bisexual flowers. *Flowers* irregular. *Sepals* 4, in opposite pairs, broadly imbricate; the 2 outer smaller. *Petals* 4, very often small, rarely 0, glabrous or bearded on the inner face. *Disc* unilateral, lobed, or of 4 glands, very rarely obsolete. *Stamens* 8, included or shortly exerted; filaments free, usually hairy. *Ovary* compressed or didymous, 2-chambered, often hairy, with a single basal ovule in each chamber; style 2-3-lobed, or styles free. *Fruit* of 2 fleshy dry or leathery 1-locular carpels, sometimes only of 1 carpel. *Seed* erect, with a very short arillus; embryo curved.

Trees or shrubs; leaves alternate, 1-3- (rarely 5-) foliate; leaflets often large, entire or serrated; flowers small or minute; inflorescence an axillary simple raceme or lax panicle.

Species about 165, found in all tropical and sub-tropical countries, especially America; 6 species occur in South Africa and extend from the Transvaal and Natal, to Knysna.

4740

3. *DEINBOLLIA*, Schum. & Thonn.

(Under *Sapindus*, Linn.)

Plants diœcious, with occasional bisexual flowers. *Flowers* regular. *Sepals* 5, orbicular, in 2 rows, strongly imbricate. *Petals* 5, obovate or orbicular, about as long as the sepals, woolly, or with scales at the base. *Disc* annular, raised. *Stamens* 12-20, rarely only 8, inserted inside the disc in many rows;

filaments short; anthers linear-oblong, included. *Ovary* 2-3-partite to the base; each portion sub-globose, 1-chambered, with a solitary ovule attached to the base of the axis; style simple, thick, straight or twisted. *Fruit* separating into 2-3 berry-like mericarps. *Seeds* globose, with a fleshy aril; cotyledons unequal.

Trees; leaves alternate, abruptly- or impari-pinnate, often large; leaflets 2 to many-jugate; inflorescence a short or long-simple or branched axillary raceme.

Species 20, all African; 1 species (*Sapindus oblongifolius*, Sond.) found in South Africa and extends from Natal to East London.

4754

4. SMELOPHYLLUM, Radlk.

(Under *Sapindus*, Linn.)

Flowers regular or nearly so. *Calyx* deeply 5-parted, narrowly imbricated in bud. *Petals* 5. *Disc* complete. *Stamens* 6-10. *Ovary* 2-chambered, with a solitary ovule in each chamber. *Fruit* 2-lobed, with a fleshy pericarp. *Seeds* without an aril.

A tree; leaves alternate, petioled, abruptly pinnate; leaflets in 3-4 pairs, obtusely toothed, undulate, with minute pellucid dots; inflorescence an axillary panicle shorter than the leaves.

Endemic; species 1 (*Sapindus capensis*, Sond.); extends from Langekloof in the George district to Port Elizabeth.

4784

5. PAPPEA, E. & Z.

(Under *Sapindus*, Linn.)

Plants dioecious, with occasional bisexual flowers. *Flowers* regular. *Calyx* small, cupular, irregularly 5-lobed; lobes slightly imbricate. *Petals* 4-6, minute, villous within. *Disc* annular. *Stamens* 8-10 (abbreviated in the female flowers), inserted inside the disc; filaments villous, exserted; anthers oblong. *Ovary* hirsute, 3-lobed, 3-chambered (rudimentary in the male flowers), with a solitary ovule in each chamber; style short, thick; stigma simple. *Fruit* didymous or 1-3-lobed; lobes globose, pubescent. *Seeds* globose, with an arillus; embryo small.

Trees or large shrubs; leaves alternate, simple, oblong or obovate, entire, often crowded at the apices of the branches; flowers minute; inflorescence a panicle raceme; the male equalling the leaves; the female shorter and few-flowered.

Species 6, all African; 2 species in South Africa, occurring in the Transvaal, Natal, Namaqualand, and in the scrub of Albany and Uitenhage; also found in the Oudtshoorn, Willowmore, and Riversdale districts.

4826

6. ERYTHROPHYSA, E. Mey.

Flowers bisexual. *Calyx* campanulate, sub-oblique, 5-lobed. *Petals* 4, long-clawed; limb oblong, obtuse, hooded at the base and furnished with a short petaloid toothed and crested but beardless scale. *Disc* cup-shaped. *Stamens* 8, inserted in a tuft beneath a rostrate-acuminate fleshy gland at one side of the flower where the fifth petal is deficient; filaments exserted, hairy; anthers versatile. *Ovary* 3-angled, 3-chambered, with 2 ovules in each chamber; style 3-sided below. *Fruit* inflated, of 3 membranous dorsally winged valveless carpels connate by their inner faces. *Seed* solitary, globose, purple.

Shrubs; leaves alternate, imparipinnate, crowded near the ends of the branches; rhachis winged; inflorescence a racemose corymb.

Species 2; 1 found in Madagascar, the other in Namaqualand.

4831

7. DODONAEA, Linn.

Plants dioecious, or occasionally with bisexual flowers. *Pepals* 2-5-parted, imbricate or valvate. *Petals* 0. *Disc* in the male flowers obsolete; in the female flowers small. *Stamens* 5-8; filaments very short; anthers linear-oblong, obtusely 4-angled. *Ovary* sessile, 3-6-angled, 3-6-chambered, with 2 ovules in each chamber; style 3-6-angled and 3-6-fid at the apex. *Fruit* a membranous capsule, 2-6-angled, with the angles acute obtuse or winged, septically 2-6-valved, 1-2-seeded in each loculus. *Seeds* lenticular or sub-globose, compressed; embryo spiral.

Trees or shrubs, often viscid; leaves alternate, simple (in the South African species) or abruptly pinnate; flowers small; inflorescence an axillary or terminal raceme, corymb, or panicle.

Species about 50, mostly Australian; 2 species in South Africa, found in the south-western districts and the coastal belt to Natal and the Transvaal; also occur in the Karroo and Namaqualand.

4836

8. HIPPOBROMUS, E. & Z.

Plants dioecious, with occasional bisexual flowers. *Calyx* of 5 sepals, unequal, persistent. *Petals* 5, obovate, without scales, imbricate. *Disc* annular. *Stamens* 8, inserted within the disc, exserted; filaments filiform; anthers oblong. *Ovary* silky-tomentose, sub-globose, 3-chambered, with 1 ovule (rarely 2) in each chamber; style short, thick; stigma capitate, 3-fid. *Fruit* globose, obscurely 3-lobed, 3-locular, 1- (rarely 2-) seeded, indehiscent. *Seed* without an aril.

A resiniferous tree; leaves alternate, abruptly pinnate; leaflets sessile, sub-opposite, toothed, serrated, or entire; rachis evidently winged; flowers sub-globose, velvety; inflorescence a densely-flowered panicle.

Endemic; species 1, occurring from Port Elizabeth and the eastern scrub and forests to Natal and the Transvaal.

107. MELIANTHACEÆ.

Flowers bisexual, or bisexual with occasional male or female flowers on different plants. *Sepals* 5, free or connate, imbricate. *Petals* 5, or 1 aborted imbricate. *Disc* unilateral or cupular. *Stamens* 4-10, inserted inside the disc; filaments free or connate. *Ovary* superior, usually deeply lobed, 4-5-chambered, with 1 to many ovules in each chamber; style simple; stigma truncate, capitate, or toothed. *Fruit* a capsule. *Seeds* with or without an aril; embryo straight; endosperm present.

Trees or shrubs, sometimes undershrubs; leaves alternate, imparipinnate or simple; stipules present or absent; inflorescence a terminal or axillary raceme.

Genera 3; species 30, all African.

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| 1. Leaves simple | 3. <i>Greyia</i> , Hook. & Harv. |
| Leaves pinnate | 2 |
| 2. Filaments connate; ovary-chambers with 1 ovule in each; fruit a leathery or globose capsule | 1. <i>Bersama</i> , Fres. |
| Filaments free; ovary-chambers with 2-4 ovules in each; fruit a papery capsule | 2. <i>Melanthus</i> , Linn. |

4853

1. BERSAMA, Fres.

(Natalia, Hochst.)

Flowers bisexual, or bisexual with occasional male or female flowers on different plants. *Sepals* 5, sub-equal, free or more or less connate, hairy, imbricate. *Petals* 5, unequal, clawed, nude or glandular at the apex, hairy,

imbricate. *Disc* unilateral or semi-annular. *Stamens* 4, inserted inside the disc ; filaments all connate and hairy, or the 2 anterior connate at the base. *Ovary* 4-5-chambered, with a solitary erect ovule in each chamber ; style elongated, curved ; stigma truncate. *Fruit* a globose or oblong leathery or woody capsule, 4-5-locular, loculicidally 4-5-valved. *Seeds* with an arillus ; embryo straight ; endosperm dense.

Trees or shrubs ; leaves imparipinnate ; leaflets 2 to many-jugate, entire or toothed ; flowers silky ; inflorescence a terminal or lateral simple raceme.

Species 28 ; 6 species occur in South Africa, extending from the northern Transvaal and Natal to Komgha.

4854

2. MELIANTHUS, Linn.

Flowers bisexual. *Calyx* compressed, 5-partite, with or without a saccate gibbosity at the base, furnished with a gland within ; lobes strongly unequally imbricated. *Petals* 5, sub-perigynous, long-clawed, tomentose at the middle ; the outer one abortive or 0. *Disc* thickened, unilateral, at the bottom of the calyx. *Stamens* 4, inserted inside the disc, didymous ; filaments free. *Ovary* 4-lobed, 4-chambered, with 2-4 ovules in 2 rows in each chamber ; style incurved, filiform, 4-toothed at the apex. *Fruit* a papery capsule, deeply 4-lobed, 4-locular, with the loculi 1-seeded by abortion. *Seeds* sub-globose, shining, without an aril ; embryo small ; endosperm copious.

Shrubs or undershrubs, often strong smelling ; leaves imparipinnate ; leaflets with unequal sides, toothed ; stipules present ; inflorescence an axillary or terminal raceme.

Endemic ; species 6, extending from S.W. Africa through the coastal belt round to Natal and the Transvaal ; also found in the central and north-western districts.

4855

3. *Greyia, Hook. & Harv.

Flowers bisexual. *Calyx* 5-partite, short, persistent ; segments imbricate. *Petals* 5, deciduous, imbricate, with the margins finely ciliate. *Disc* fleshy, cupular, 10-lobed ; lobes alternating with the stamens, with a large gland at the apex. *Stamens* 10, inserted deep in the calyx and between the disc and the ovary, sub-hypogynous, in 2 rows, free, exerted ; filaments subulate ; anthers ovate, shortly didymous, with longitudinal dehiscence. *Ovary* oblong in outline, deeply 5-furrowed, 5-chambered, with many ovules on an axile placenta ; style slender, subulate. *Fruit* a septicidal capsule. *Seeds* minute ; embryo basal ; endosperm copious, fleshy.

Small trees or shrubs ; leaves petioled, simple, sub-rotund, crenate-lobed ; petiole dilated at the base ; stipules 0 ; inflorescence a terminal pedunculate raceme ; flowers showy ; bracts small, lanceolate.

Endemic ; species 3, extending from the northern Transvaal and Natal to Komgha ; also recorded from the Queenstown district.

108. BALSAMINACEÆ.

Flowers bisexual, zygomorphic. *Sepals* 3-5, usually coloured, with the posticous sepal large saccate and produced at the base into a spur or bag. *Petals* 3-5, usually more or less connate ; the anterior petal (opposite the spurred sepal) larger than the others. *Stamens* 5, very short ; anthers more

* Hutchinson "The Families of Flowering Plants" has proposed a new family (*Greyiaceæ*) for this genus.

or less cohering. *Ovary* superior, 5-chambered, with 2-3 or many ovules in each chamber; style 0; stigmas 5, sessile, free or stigma 5-toothed. *Fruit* a capsule, rarely a berry. *Seeds* glabrous or hairy; embryo straight; endosperm 0.

Herbaceous plants, found in damp places, sometimes aquatics, sometimes shrubby at the base; leaves opposite or alternate, radical, entire, toothed sometimes, or serrated; stipules 0; flowers often showy, 1 to many on axillary peduncles which are either solitary or clustered; inflorescence sometimes a panicle.

Genera 2; species over 300, found in all tropical and sub-tropical countries.

4856

1. IMPATIENS, Linn.

Sepals 3, rarely 5, imbricate; the 2 lateral small, flat, usually green; the posterior large, petaloid, produced into a hollow spur or sac. *Petals* 3-5; the anterior large; the lateral 2-lobed or connate. *Stamens* 5; filaments short, broad; anthers cohering. *Ovary* with many ovules in 1 row in each chamber; stigma 5-toothed. *Fruit* a loculicidal capsule; valves 5, elastically springing away from a placentiferous axis. *Seeds* smooth or tubercled, glabrous or hairy.

Herbs, rarely shrubby at the base; leaves opposite or alternate, rarely whorled or radical, simple; stipular glands sometimes present at the base of the petiole; flowers in scapes, or on axillary or terminal 1-2 to many-flowered peduncles.

Species over 300, chiefly natives of Africa and tropical Asia; 2 species in South Africa, found in damp places in woods from George to Natal and the Transvaal.

109. RHAMNACEÆ.

Flowers bisexual, more rarely bisexual with occasional male or female flowers on different plants. *Calyx* tubular, obconic, or urceolate, free or more or less adnate to the ovary; lobes 4-5, valvate. *Petals* 4-5 or 0, inserted in the calyx-throat small, hood-shaped or flat, sessile or clawed. *Disc* perigynous, rarely 0, lining the calyx-tube or free, sometimes lobed. *Stamens* 4-5, inserted with the petals and opposite them; filaments subulate, rarely dilated; anthers versatile, didymous or oblong. *Ovary* sessile, superior or more or less inferior, 3- (rarely 2-4-) chambered, with 1 (rarely ovules 2) erect basal ovule in each chamber. *Fruit* free or enclosed in the calyx-tube, a drupe or capsule, often 3-coccus. *Seed* solitary in each fruit-loculus, erect; embryo large; endosperm fleshy, often scanty, very rarely 0.

Trees or shrubs, very rarely herbs, erect or scandent, often spiny; leaves alternate, rarely opposite, simple, entire or serrate; stipules usually present; flowers small; inflorescence a cyme, umbel, spike, or head.

Genera 51; species about 465, natives of warm and tropical countries.

Tribe *Zizyphæ*: *Ovary* superior or semi-superior; disc filling the calyx-tube; drupe fleshy or dry, with the stone 1-3-locular, surrounded by the calyx-tube; shrubs or trees (genus 1).

Tribe *Rhamnæ*: *Ovary* inferior or superior; disc various or 0; fruit dry or drupaceous, dividing into 3, rarely 2-4, cocci or pyrenes, which are indehiscent or 2-valved; trees or shrubs (genera 2-5).

Tribe *Gouaniæ*: *Ovary* inferior; disc various; fruit coriaceous, 3-4-coccus, very often 3-winged or 3-angled, crowned at the apex with the calyx-limb; shrubs, rarely herbs (genera 6-7).

1. *Ovary* superior or almost so, sometimes immersed in the disc 2
- Ovary* inferior or half-inferior 4
2. Style simple, 2-3-fid at the apex; inflorescence a small umbel

2. *Scutia*, Brongn.

Styles 2-4, free, or connate below; inflorescence a cyme or raceme 3

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| 3. Leaves palmately veined | 1. <i>Zizyphus</i> , <i>Juss.</i> |
| Leaves penninerved | 3. <i>Rhamnus</i> , <i>Linn.</i> |
| 4. Flowers solitary or 3-nate on long slender branches; styles 2-4,
connate at the base | 7. <i>Marlothia</i> , <i>Engl.</i> |
| Inflorescence a head, spike, panicle, or cyme; style simple, 2-3-fid
at the apex | 5 |
| 5. Stem climbing, furnished with tendrils | 6. <i>Helinus</i> , <i>E. Mey.</i> |
| Stems not climbing | 6 |
| 6. Ovary half-inferior; calyx glabrous; style 3-angled at the base | 4. <i>Noltia</i> , <i>Reichb.</i> |
| Ovary inferior; calyx woolly or bearded; style terete | 5. <i>Phyllica</i> , <i>Linn.</i> |

4861

1. ZIZYPHUS, *Juss.*

Flowers bisexual. *Calyx* 5-fid; lobes spreading, keeled within. *Petals* 5, rarely 0, clawed, deflexed. *Disc* flat, 5-angled, expanded, adhering to the calyx-tube. *Stamens* 5, included or exserted; filaments subulate. *Ovary* superior, immersed in the disc and adnate to it, 2- (rarely 3-, or very rarely 4-) chambered, with a solitary ovule in each chamber; styles 2-3, free or connate, diverging; stigmas papillose. *Fruit* a fleshy drupe. *Seed* sub-orbicular, compressed; cotyledons thick; endosperm 0.

Trees or shrubs, sometimes decumbent, often spiny; leaves alternate, petioled, entire or crenate, palmately veined; inflorescence a short axillary cyme.

Species about 81, natives of Africa, tropical America, Australia, and the Mediterranean Region; 3 species, possibly 4, in South Africa, extending from the Transvaal and Natal, to Grahamstown, Alicedale, Somerset East, and Cradock; also found in the O.F.S., the western Transvaal, and Bechuanaland.

4874

2. SCUTIA, *Brongn.*

Flowers bisexual. *Calyx* urceolate, 5-cleft; segments erect, keeled within. *Petals* 5, clawed, erect, flat or cucullate. *Disc* fleshy, covering the tube of the calyx. *Stamens* 5, sub-equalling the petals, free. *Ovary* superior, immersed in the disc, but not adnate to it, 2-4-chambered, with a solitary ovule in each chamber; style short, 2-3-fid; stigmas papillose. *Fruit* an obovoid or sub-globose dry or somewhat fleshy drupe, surrounded at the base by the persistent calyx-tube. *Seeds* compressed; cotyledons sub-fleshy; endosperm 0 or thin.

Smooth unarmed or spiny shrubs; leaves opposite, sub-opposite, or approximating in pairs, simple, entire or serrated; stipules minute, deciduous; inflorescence a few-flowered axillary simple umbel, scarcely longer than the petioles.

Species 11, natives of Africa, Madagascar, and Brazil, but found in most tropical countries; 1 species in South Africa, extending from Natal through the coastal districts to the Cape; also recorded from Queenstown.

4875

3. RHAMNUS, *Linn.*

Flowers bisexual, or bisexual with occasional male or female flowers on different plants. *Calyx* urceolate, 4-5-cleft; lobes erect or spreading, keeled within. *Petals* 4-5 or 0, cucullate or flat. *Disc* lining the calyx-tube. *Stamens* 4-5; filaments very short. *Ovary* superior, 2-4-chambered, with a solitary ovule in each chamber; styles 3-4, joined or free; stigma papillose. *Fruit* a fleshy drupe, oblong or spherical. *Seeds* obovate; cotyledons flat or with recurved margins; endosperm fleshy.

Shrubs or small trees ; leaves alternate or opposite, simple, petioled, entire or toothed, penninerved ; stipules small, deciduous ; inflorescence an axillary raceme or cyme.

Species about 156, natives of warm and temperate Europe, Asia, America, Africa, Australia, and the Pacific Islands ; 2 species in South Africa, extending from the Transvaal and Natal to Riversdale ; also recorded from the Graaff-Reinet, Somerset East, and Aliwal North districts.

4880

4. NOLTIA, Reichb.

(Noltea, Reichb.)

Plants diœcious, with occasional bisexual flowers. *Calyx* urceolate, 5-fid, with the tube partly adnate to the ovary. *Petals* 5, cucullate, sessile. *Disc* thin, lining the calyx-tube. *Stamens* 5, enclosed within the petals ; filaments subulate. *Ovary* half-inferior, 3-chambered, with a solitary ovule in each chamber ; style simple, 3-angled, 3-lobed at the apex. *Fruit* inferior, spherical, dry, 3-coccus, 3-valved ; valves with a small rib-like dorsal wing on the upper part, separating septicidally from a 3-partite central axis. *Seed* solitary, erect ; embryo straight ; endosperm fleshy.

A glabrous shrub ; leaves alternate, simple, serrated ; flowers small ; inflorescence a few-flowered terminal or axillary panicle.

Endemic ; species 1, extending from the Cape to Natal.

4886

5. PHYLICA, Linn.

Flowers bisexual. *Calyx* urceolate or cylindric, 5-cleft ; lobes woolly or bearded without, glabrous or bearded within. *Petals* 5, cucullate, or bristle-like, or 0. *Disc* more or less distinct. *Stamens* 5, hidden by the petals ; filaments very short, incurved ; anthers ovate or didymous, 2- or 1-theous. *Ovary* inferior, 3-chambered, with a solitary ovule in each chamber ; style short, rarely elongated, 3-fid at the apex. *Fruit* crowned with the persistent calyx, globose or ovoid, 3-coccus. *Seeds* obovoid, with a fleshy funicle ; cotyledons plano-compressed ; endosperm fleshy.

Shrubs, very rarely trees ; leaves small, rarely large, alternate, simple, entire, ovate, lanceolate, or linear ; stipules 0, very rarely present ; flowers small, axillary, or inflorescence a spike or head ; bracts present or absent.

Species about 82, mostly South African ; a few are found in southern central Africa, Madagascar, and the Island of Tristan d'Acunha ; 73 species occur in South Africa, typically south-western, but with 2 species extending into Natal.

4905

6. HELINUS, E.Mey.

Flowers bisexual. *Calyx* obconic, 5-cleft. *Petals* 5, cucullate, inserted on the margin of the disc. *Disc* epigynous, flat, lining the calyx-tube. *Stamens* 5, equalling the petals. *Ovary* inferior, 3-chambered, with a single ovule in each chamber ; style short, 3-fid and recurved at the apex. *Fruit* obovate-globose, areolate at the apex, 3-coccus ; cocci at length dehiscent, with a 3-partite central axis. *Seeds* plano-convex ; cotyledons flat, large ; endosperm fleshy.

Climbing shrubs, furnished with tendrils ; leaves alternate, simple, petioled, cordate ; stipules small, deciduous ; inflorescence an umbel.

Species 4, natives of Africa, Madagascar, and India ; 1 species in South Africa, found in the Transvaal, Zululand, Natal, and extending to the Zuurberg in the Uitenhage district.

4907

7. MARLOTHIA, Engl.

Flowers bisexual. *Calyx-lobes* 5, semi-ovate, acute, spreading. *Petals* 5, concave, inserted on the margin of the disc. *Disc* surrounding the ovary, broadly 5-lobed; lobes opposite the calyx-lobes. *Stamens* 5, inserted on the margin of the disc; filaments thick; anthers shortly ovate, with longitudinal dehiscence. *Ovary* inferior, 2-3-chambered, with a single basal ovule in each chamber; style 3-partite; stigma small. *Fruit* unknown.

An undershrub, with long slender remotely leafy branches; leaves alternate, simple, shortly petioled, lanceolate; stipules small; flowers solitary or 3-nate; bracteoles small.

Endemic; species 1, only known from Bechuanaland.

110. HETEROPYXIDACEÆ.

Flowers bisexual, regular. *Calyx-tube* cup-shaped; lobes 5, imbricate. *Petals* 5, shortly clawed, gland-dotted. *Stamens* 5-8, opposite the petals, inserted on the margin of a disc lining the calyx-tube; filaments exerted; anthers oblong, 2-theous. *Ovary* superior, 3-lobed, 2-3-chambered, with many ovules in each chamber; style simple; stigma capitate. *Fruit* a small capsule, 2-3-locular, partly included in the persistent calyx, loculicidally dehiscent. *Seeds* few, linear-oblong, flat; endosperm 0.

Small trees; leaves alternate, simple, petioled, entire, gland-dotted; flowers small; inflorescence a terminal panicle.

Genus 1; species 2, probably 3, natives of South Africa.

4908a

HETEROPYXIS, Harv.

Characters of the Family. Found in the Transvaal and Natal.

NOTE.—The exact systematic position of this genus has been much disputed. Harvey (Thes. Cap.) has a note on its affinity, and places it in the family *Lythraceæ* and discusses its affinities with *Myrsinaceæ* and *Rhamnaceæ*. Hallier (Abh. Naturw. Ver. Hamburg XVIII (1903), 89) places it in the *Myrtaceæ* as allied to the genus *Metrosideros*. Bentham and Hooker (Gen. Plant. I, p. 785) place it as an anomalous genus under *Lythraceæ*, while Engler (Pflanzenfam. Nachträge p. 335) suggests an affinity with *Rutaceæ*, of which it might perhaps be a sub-family. Hutchinson "The Families of Flowering Plants" places it in a separate family in the Order *Rhamnales*.

111. VITACEÆ.

Plants sometimes monœcious, or sometimes with occasional bisexual flowers. *Flowers* sometimes all bisexual, regular. *Calyx* small, entire or 4-5- (rarely 3-7-) toothed. *Petals* 4-5, seldom 3-7, free or cohering, valvate. *Disc* various, between the stamens and the ovary, sometimes adnate to the petals or stamens or ovary. *Stamens* 4-5, seldom 3-7, opposite the petals, inserted at the base of the disc or between the lobes of the disc; filaments subulate; anthers free or connate, 2-theous. *Ovary* superior, often immersed in the disc, 2-8-chambered, with 1 (rarely 2) ovule in each chamber; style short, or elongated, or 0. *Fruit* a berry, 1-8-locular, with 1 (rarely 2) seed in each loculus. *Seeds* erect, often with a cavity; embryo short, with oval cotyledons; endosperm cartilaginous.

Trees or shrubs, often scandent and furnished with tendrils; stems woody, succulent, or fleshy; leaves alternate, simple or 3-5-foliate, or rarely bi-pinnate, or palmately divided; stipules present or 0; flowers small; inflorescence opposite the leaves, a paniculate cyme or raceme, rarely a spike.

Genera 12; species about 480, natives of tropical and warm temperate countries.

1. Petals 5, cohering at the top and falling off together; disc 5-lobed; seeds pear-shaped, with 2 cavities on the ventral face **1. Vitis, Linn.**
- Petals 4-7, usually spreading at the time of flowering, very rarely cohering at the top, and then only 4; disc 5-angled or 4-lobed; seeds more or less egg-shaped **2**
2. Petals 5-6, very rarely 4-7; disc enveloping the ovary, bluntly 5-angled, but the margin in one plane; style short (up to 0.5 mm.)

2. Rhoicissus, Planch.

 Petals 4: disc adnate to the ovary, produced into 4 short blunt vertical lobes; style long (1 mm. or more) **3. Cissus, Linn.**

4909

1. VITIS, Linn.

Plants dioecious, or with occasional bisexual flowers. *Flowers* rarely all bisexual. *Calyx* minute. *Corolla* of 5 petals which cohere at the top and fall off all together, caducous. *Disc* hypogynous, often glandular. *Stamens* 4-5, opposite the petals. *Ovary* 2-chambered, rarely 3-4-chambered, with 2 ovules in each chamber; style very short, conical. *Fruit* a juicy berry. *Seeds* pear-shaped, with 2 pits on the ventral face.

Trailing or climbing plants, furnished with tendrils; leaves alternate, simple, petioled, palmately lobed, angled, or coarsely toothed; stipules present; inflorescence an elongated raceme or panicle.

Species about 28, natives of the northern hemisphere and sub-tropical countries; cultivated in South Africa.

4917

2. RHOICISSUS, Planch.

Flowers usually bisexual, usually 5-merous, more rarely 4-7-merous. *Calyx* small and saucer-shaped. *Petals* thickened, fleshy, persistent. *Disc* annular, adnate to the ovary. *Ovary* 2-chambered, with 2 ovules in each chamber; style usually short. *Fruit* a 1-4-seeded berry. *Seeds* more or less egg-shaped.

Climbing shrubs; leaves alternate, compound; inflorescence mostly a compact cyme.

Species 15, all African; 7 species occur in South Africa, extending in forests and scrub from the northern Transvaal and Natal to the Cape.

4918

3. CISSUS, Linn.

Flowers bisexual, or sometimes with unisexual flowers on the same plant. *Calyx* small, very shortly 4-lobed. *Petals* 4, not thickened, spreading at the time of flowering. *Disc* saucer-shaped, 4-lobed, adnate to the ovary. *Ovary* 2-chambered, with 2 ovules in each chamber; style subulate, usually long. *Fruit* a berry. *Seeds* more or less egg-shaped.

Climbing plants, furnished with tendrils; leaves alternate, simple or 3-foliate; the segments or leaflets entire or toothed; flowers small; inflorescence a small cyme.

Species about 250, found in all tropical countries; 17 species in South Africa, widely spread, but absent from the south-western districts.

112. TILIACEÆ.

Flowers regular, bisexual, rarely unisexual. *Sepals* 5, rarely 3 or 4, free or connate, often valvate. *Petals* free, equalling the number of sepals and alternating with them, rarely 0, often with a gland at the base, imbricate or valvate. *Stamens* indefinite, rarely sub-definite, often on a distinct torus, free or sometimes connate at the base, all fertile, or the outer sterile; filaments filiform. *Ovary* superior, 2-10-chambered, with 1 to many ovules in each chamber; style entire, or lobed at the apex, or the stigmas almost free. *Fruit* a capsule, dry or fleshy, 2-10-locular, or 1-locular by abortion, sometimes transversely divided between the seeds, with 1 to many seeds in each loculus. *Seeds* ascending, pendulous or transverse; embryo straight; endosperm fleshy or horny.

Trees or shrubs, rarely herbs; leaves alternate, very rarely opposite or sub-opposite, simple, entire, toothed, or lobed; stipules in pairs, usually small and deciduous, rarely large and persistent; flowers axillary and terminal, or inflorescence often a cyme, with the cymes sometimes in corymbs or panicles.

Genera 44, with over 400 species, widely dispersed, especially in the tropics.

Tribe *Tiliæ*: Sepals distinct; petals scarcely foveolate, inserted round the stamens (genera 1-3).

Tribe *Grewiæ*: Sepals distinct; petals foveolate at the base, inserted more or less round the base of a raised torus which bears the stamens (genera 4-5).

- | | |
|---|---------------------------------|
| 1. Outer stamens sterile, without anthers | 2 |
| Stamens all fertile | 3 |
| 2. Filaments, especially those of the sterile stamens, moniliform | |
| Filaments not moniliform | 2. <i>Sparmannia</i> , Linn. f. |
| 3. Petals with a gland or pit at the base | 3. <i>Honckenya</i> , Willd. |
| Petals without a gland or pit | 4. <i>Grewia</i> , Linn. |
| 4. Ovules many in each ovary-chamber | 1. <i>Corchorus</i> , Linn. |
| Ovules 2 in each ovary-chamber | 5. <i>Triumfetta</i> , Linn. |

4953

1. CORCHORUS, Linn.

Flowers bisexual. *Sepals* 4-5. *Petals* 4-5, clawed, nude. *Stamens* numerous, rarely twice the number of the petals, free, springing from a short torus. *Ovary* 2-6-chambered, with many ovules in each chamber; style short; stigma cup-shaped, 2-6-lobed. *Fruit* an elongated capsule, slender or sub-globose, smooth or prickly, loculicidally 2-5-valved, sometimes with transverse septa, many-seeded. *Seeds* pendulous or horizontal; embryo curved.

Herbs or undershrubs, covered with simple or stellate hairs; leaves alternate, serrate, with the teeth sometimes produced into long setaceous points; stipules lateral; flowers yellow, on short simple or branched peduncles, which are axillary or opposite the leaves.

Species about 51, found in all tropical countries; 9 species in South Africa, found in the Transvaal, Natal, the western O.F.S., and the north-western districts.

4957

2. SPARMANNIA, Linn. f.

Flowers bisexual. *Sepals* 4, deciduous. *Petals* 4, nude. *Stamens* numerous, free, on a short torus; the outer sterile, moniliform; the inner fertile, sometimes moniliform. *Ovary* 4-5-chambered, with numerous ovules in each chamber; style simple; stigma toothed or simple. *Fruit* an oblong or globose capsule, 4-5-locular, with numerous seeds in each loculus, 4-5-valved, with the valves covered with rigid prickles. *Seeds* obovoid; embryo plicate or almost straight.

Shrubs or small trees ; leaves alternate, petioled, angled, lobed, crenate, or serrate, palmately veined, softly tomentose or stellately pubescent ; stipules lateral, small, persistent ; flowers white ; inflorescence a terminal umbel.

Species 6, natives of Africa and Madagascar ; 2 species occur in South Africa, extending from the Transvaal and Natal to the Amatolas, and then from Uitenhage to Riversdale.

4958

3. HONCKENYA, Willd.

Flowers bisexual. *Sepals* 4-5. *Petals* 4-5, nude at the base. *Stamens* indefinite, free, inserted on a contracted torus ; the outer stamens many, filiform, without anthers ; the inner 8-10, bearing linear 2-theous anthers. *Ovary* 4-8-chambered, with numerous ovules in each chamber ; style filiform ; stigma toothed. *Fruit* an oblong capsule, loculicidally 4-8-valved, transversely septate within, many-seeded ; valves covered with prickles. *Seeds* horizontal, compressed ; cotyledons broad.

Shrubs or trees, with stellate pubescence ; leaves alternate, simple, toothed, or 3-5-lobed ; flowers large, showy ; inflorescence a terminal raceme.

Species 3, all African ; 1 species doubtfully recorded from the northern Transvaal.

4966

4. GREWIA, Linn.

Flowers bisexual. *Sepals* 5, usually coloured within, deciduous. *Petals* 5, clawed, each with a gland or pit at the base, inserted at the base of a short torus. *Stamens* indefinite, free, all fertile, arising from a raised glandular torus. *Ovary* 2-4-chambered, with 2 to many ovules in each chamber ; style simple ; stigma shortly 2-4-lobed. *Fruit* a 1-4-lobed or entire drupe, containing 1-4 pyrenes. *Seeds* ascending or horizontal ; cotyledons flat, leafy.

Trees or shrubs ; leaves alternate, simple, entire or serrate, 3-7-nerved at the base ; stipules lateral ; flowers purple or yellow, solitary, or inflorescence an axillary cyme.

Species about 250, natives of Africa, Asia, and Australia ; 18 species found in South Africa, fairly widely distributed, but absent from the greater part of the Karroo.

4975

5. TRIUMFETTA, Linn.

Flowers bisexual. *Sepals* 5, distinct, frequently hooded and provided with a little point at or near the apex, coloured, deciduous. *Petals* 5, without glands, or glandular beneath, inserted at the base of a short columnar torus. *Stamens* 5-30, inserted on a fleshy lobed glandular torus ; filaments thread-like, sometimes slightly moniliform. *Ovary* 2-5-chambered, with 2 ovules in each chamber ; style filiform ; stigma 2-5-lobed. *Fruit* a small globose or oblong capsule, echinate or setose, indehiscent or dividing into 3-6 valves, each loculus 1-2-seeded. *Seeds* pendulous ; embryo straight.

Shrubs, undershrubs, or herbs ; leaves alternate, simple, entire, lobed, or serrate, many-nerved, with glands frequently on the serratures on the under side ; flowers small, yellow or orange, solitary or clustered on simple or branched stalks.

Species about 115, found in all tropical countries but mostly African ; 9 species in South Africa, found in the Transvaal, Natal, Bechuanaland, and S.W. Africa.

113. MALVACEÆ.

Flowers regular, usually bisexual. *Epicalyx* of 3 to many segments, free or connate, sometimes adnate to the calyx-tube, sometimes absent. *Calyx* of 5 (rarely 3-4) sepals, lobed or sub-entire, valvate. *Petals* 5 (in all the South African species), rarely 0. *Stamens* many, hypogynous, united into a staminal-tube; staminal-tube bearing filaments at the apex, or truncate, or toothed and bearing anthers on its outer surface. *Torus* small, or conical in the centre of the gynæcium, sometimes produced beyond the carpels and dilated at the apex. *Gynacium* of 2 to many free or fused carpels, arranged round the torus, with 1 to many ovules in each ovary; style-branches as many as or twice as many as the carpels, more rarely style entire and club-shaped at the apex. *Fruit* dry, rarely fleshy, usually breaking up into separate dehiscent or indehiscent carpels. *Seeds* reniform, sub-globose or obovoid, glabrous or hairy; embryo straight or curved; endosperm scanty or 0, rarely copious and fleshy.

Herbs, shrubs, or trees, often softly hairy, or with stellate pubescence; leaves alternate, simple, entire, lobed, or more rarely dissected; stipules free, narrow or setaceous, deciduous, sometimes minute and scarcely conspicuous; flowers usually pedicelled, axillary and solitary, more rarely inflorescence a spike or raceme.

Genera 43; species about 800, widely dispersed all over the world, except in cold countries.

Tribe **Malvæ**: Staminal-column bearing anthers at the apex or all the way to the apex; style-branches as many as the carpels or ovary-chambers; mature carpels separating from an axis or receptacle; cotyledons foliaceous, biplicate or variously contorted-plicate (genera 1-8).

Tribe **Urenæ**: Staminal-column truncate or 5-toothed at the apex, bearing anthers on the outside; style-branches twice the number of the carpels; carpels 5, separating from an axis or receptacle when mature; cotyledons as in **Malvæ** (genera 9-10).

Tribe **Hibiscæ**: Staminal-column truncate or 5-toothed at the apex, bearing anthers on the outside, very rarely also at the summit; style-branches or stigmas the same number as the ovary-chambers; fruit a loculicidal capsule; the carpels not separable; cotyledons as in **Malvæ** (genera 11-15).

- | | |
|---|---------------------------------|
| 1. Ovule solitary in each ovary or ovary-chamber | 2 |
| Ovules 2 or more in each ovary or ovary-chamber | 10 |
| 2. Style-branches as many as the carpels or ovary-chambers | 3 |
| Style-branches twice as many as the carpels or ovary-chambers | 9 |
| 3. Staminal-column truncate or 5-toothed at the apex, bearing anthers on its outer surface | 12. <i>Kosteletzkya</i> , Presl |
| Staminal-column bearing anthers at the apex or all the way up | 4 |
| 4. Epicalyx 0, or distant from the calyx | 5 |
| Epicalyx present | 6 |
| 5. Ovule pendulous | 8. <i>Sida</i> , Linn. |
| Ovule ascending | 7. <i>Malvastrum</i> , A. Gray |
| 6. Epicalyx of 3-9 segments connate at least at the base | 7 |
| Epicalyx of 3 free segments | 8 |
| 7. Epicalyx of 3-6 connate segments; torus in fruit produced beyond the carpels and either conical or dilated | 4. <i>Lavatera</i> , Linn. |
| Epicalyx of 6-9 segments connate at the base; torus in fruit not produced beyond the carpels | 5. <i>Althæa</i> , Linn. |
| 8. Style-branches pointed, longitudinally stigmatose | 6. <i>Malva</i> , Linn. |
| Style-branches club-shaped, truncate or capitate and stigmatose at the apex | 7. <i>Malvastrum</i> , A. Gray |
| 9. Fruit carpels covered with hooked bristles; leaves glandular beneath | 9. <i>Urena</i> , Linn. |
| Fruit carpels awned, setose, or winged, rarely smooth; leaves not glandular beneath | 10. <i>Pavonia</i> , Cav. |

10. Epicalyx 0 **1. Abutilon, Gaertn.**
 Epicalyx present 11
11. Staminal-column truncate or 5-toothed at the apex, bearing anthers
 on its outer surface 12
 Staminal-column bearing anthers at the apex or all the way up . . . 15
12. Calyx and epicalyx covered with black dots 13
 Calyx and epicalyx not dotted 14
13. Epicalyx of 3 to many small or deciduous segments; ovary
 3-4-chambered **14. Cienfuegosia, Cav.**
 Epicalyx of 3 large cordate segments; ovary 5-chambered **15. Gossypium, Linn.**
14. Epicalyx of 5-20 free or cohering segments; style-branches capitate
 or dilated at the apex **11. Hibiscus, Linn.**
 Epicalyx of 3-8 small or deciduous segments; style club-shaped,
 5-furrowed or obscurely divided into stigmatic lobes **13. Thespesia, Corr.**
15. Carpels dorsally 2-awned and transversely septate within
 **3. Modiola, Moench.**
 Carpels not awned or transversely septate **2. Sphaeralcea, St. Hill.**

4983

1. ABUTILON, Gaertn.

Epicalyx 0. *Calyx* 5-fid. *Staminal-column* divided at the apex into many filaments. *Gynæcium* of 5 to many carpels (20 or more), closely united in a circle round a central torus, with 3-9 ovules in each ovary; style-branches as many as the carpels, filiform or clavate, stigmatose at the apex. *Fruit* of numerous follicular 3-6-seeded carpels, or the carpels cohering at the base, dehiscing by the ventral suture or sub-persistent. *Seeds* sub-reniform.

Herbs or shrubs, rarely trees, often softly tomentose; leaves usually on long petioles, often cordate, angled or lobed, rarely narrow; flowers mostly axillary, yellow or orange.

Species about 213, found in all tropical and sub-tropical countries; 16 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district.

4986

2. SPHAERALCEA, St. Hill.

(*Sphaeroma*, Harv.)

Epicalyx of 3 or 2 free segments, or connate and 3-cleft. *Calyx* 5-fid. *Staminal-column* divided at the apex into many filaments. *Gynæcium* of many carpels, with 2-3 ovules in each ovary; style-branches as many as the carpels, filiform or clavate, stigmatose at the apex. *Fruit* sub-globose, of many compressed dehiscing 2-3-seeded carpels which are united in a ring round a central torus from which they slowly separate. *Seeds* reniform.

Herbs, shrubs, or undershrubs; leaves often angled or lobed; flowers solitary or fascicled, axillary, sometimes spicate on the branches, flesh-coloured or purple.

Species about 88, natives of America and Africa; 17 species in South Africa, found in Natal and extending through the coastal belt to Clanwilliam; also in the north-eastern districts and Basutoland.

4987

3. MODIOLA, Moench.

Epicalyx of 3 free segments. *Calyx* 5-fid. *Staminal-column* divided at the apex into many filaments. *Gynæcium* of many carpels, with 2-3 ovules in each ovary; style-branches as many as the carpels, filiform, capitate. *Fruit* of carpels separating from a central axis, each carpel dorsally 2-awned, 2-valved, transversely septate between the seeds. *Seeds* reniform.

Prostrate herbs ; leaves cut ; flowers small, axillary, pedicelled, red.

Species 1, found in South Africa and America ; recorded from Pretoria in the Transvaal.

4990

4. LAVATERA, Linn.

Epicalyx of 3-6 connate segments. *Calyx* 5-fid. *Staminal-column* divided into many filaments. *Gynæcium* of many carpels, with a single ovule in each ovary ; style-branches as many as the carpels, longitudinally stigmatose. *Fruit* of carpels which are arranged in a depressed circle, indehiscent, verticillate round the torus or axis, which is usually produced beyond the carpels and either conical or variously dilated above them. *Seeds* ascending.

Herbs, shrubs, or trees, tomentose or hirsute ; leaves angled or lobed ; flowers pedicelled, solitary and axillary, or inflorescence a terminal raceme.

Species about 24, natives of the Mediterranean Region, the Canary Islands, Australia, and central Asia ; 1 species found in South Africa as an introduction.

4991

5. ALTHAEA, Linn.

Epicalyx of 6-9 segments connate at the base. *Calyx* 5-fid. *Staminal-column* divided at the apex into many filaments. *Gynæcium* of many carpels, with a single ovule in each ovary ; style-branches as many as the carpels, filiform, longitudinally stigmatose. *Fruit* of many reniform dry 1-seeded indehiscent carpels, separating from a central axis. *Seeds* ascending.

Annual or perennial herbs ; leaves lobed or partite ; flowers purple or white, solitary and axillary, or inflorescence a terminal raceme.

Species about 21, found in all temperate regions, especially abundant in the northern hemisphere ; 2 species in South Africa, recorded from between Verleptepram and the mouth of the Orange River.

4992

6. MALVA, Linn.

Epicalyx of 3 distinct segments. *Calyx* 5-fid. *Staminal-column* divided at the apex into many filaments. *Gynæcium* of many carpels, with a single ovule in each ovary ; style-branches as many as the carpels, longitudinally stigmatose. *Fruit* of many dry 1-seeded indehiscent carpels, separating at maturity from a central axis. *Seeds* ascending.

Herbs ; leaves often narrow, lobed or cut, sometimes round and palmately-nerved ; flowers purple, rosy, or white, axillary, sessile or pedicelled, solitary or fasciated, or rarely inflorescence a terminal raceme.

Species about 29, natives of Europe, temperate Asia, and North Africa ; naturalised in South Africa.

4995

7. MALVASTRUM, A.Gray

Epicalyx of 3 segments, sometimes absent. *Calyx* 5-fid. *Staminal-column* divided at the apex into many filaments. *Gynæcium* of 5 to many carpels, with a single ascending ovule in each ovary ; style-branches as many as the carpels, filiform or clavate, truncate or capitate. *Fruit* of carpels separating from a central axis, indehiscent, or carpels 2-valved, blunt or rostrate at the apex, sometimes shortly 2-spinose on the back. *Seeds* reniform, ascending.

Herbs or small shrubs, sometimes tufted ; leaves various, entire, cordate or partite ; flowers golden or yellow, shortly pedicelled or sub-sessile, axillary, or inflorescence a terminal spike.

Species about 152, natives of Africa and America ; 25 species in South Africa, extending from Natal to the south-western districts ; also found in the Karroo.

4998

8. SIDA, Linn.

Epicalyx 0, or distant from the calyx. *Calyx* 5-toothed or 5-fid. *Staminal-column* divided at the apex into numerous filaments. *Gynæcium* of 5 to many carpels, with a single pendulous ovule in each ovary ; style-branches as many as the carpels, filiform or sub-clavate, capitate or truncate. *Fruit* of 5 to many 1-seeded carpels, dehiscent at the summit and at length separating from a central axis. *Seeds* 3-angled, pendulous or horizontal.

Herbs or shrubs, often softly hairy or tomentose ; leaves entire or lobed ; flowers yellow, orange, or white, rarely purple, sessile or pedicelled, solitary or massed in the leaf-axils, or inflorescence a terminal raceme, spike, or head ; peduncles jointed below the summit.

Species about 175, found in all warm regions, especially America ; 8 species in South Africa, extending from the Transvaal and Natal through the eastern districts to Riversdale ; also found in Bechuanaland, S.W. Africa, Queenstown, and Somerset East.

5006

9. URENA, Linn.

Epicalyx of 5 connate segments adnate to the calyx-tube. *Calyx* 5-fid or 5-toothed. *Staminal-column* truncate or 5-toothed at the apex ; anthers numerous, almost sessile. *Gynæcium* of 5 carpels, with a single ovule in each ovary ; styles twice as many as the carpels, capitate. *Fruit* separating into 1-seeded indehiscent carpels, covered with hooked bristles ; the carpels breaking away from a central axis. *Seeds* ascending.

Rigid herbs or undershrubs ; leaves angled or lobed, glandular beneath ; flowers sessile or on very short stalks, often clustered, yellow.

Species 8, found in all warm countries ; 1 species cultivated in South Africa.

5007

10. PAVONIA, Cav.

Epicalyx of 5-8 segments, distinct or connate among themselves and with the calyx-tube. *Calyx* 5-fid or 5-toothed. *Staminal-column* naked, truncate and 5-toothed, bearing stamens on its external surface below the apex. *Gynæcium* of 5 carpels, with a single ovule in each ovary ; style-branches twice the number of the carpels, capitate. *Fruit* of 5 indehiscent 1-seeded carpels which separate from a central axis ; carpels nude, 1-3-awned or beaked, smooth or spiny, sometimes 2-winged. *Seeds* ascending.

Herbs or shrubs, tomentose, hispid, or glabrescent ; leaves often angled or lobed ; flowers yellow, white, or red, solitary and pedicelled, or in heads at the apices of the branches.

Species about 132, found in all warm countries, chiefly America ; 13 species in South Africa, occurring in the Transvaal, Natal, and through the eastern districts to Riversdale ; also extend into the north-western districts, Bechuanaland, and S.W. Africa.

5013

11. HIBISCUS, Linn.

(*Paritium*, St. Hill.)

Epicalyx of 5-20 segments, free or cohering. *Calyx* 5-fid or 5-toothed. *Staminal-column* truncate and 5-toothed, bearing stamens on its surface. *Gynæcium* of 5 fused carpels, with 3 to many ovules in each ovary ; style branches as many as the carpels, often thickened, sometimes very short, capitate or spatulate and dilated at the apex. *Fruit* loculicidally 5-valved, surrounded by the persistent calyx. *Seeds* reniform or sub-globose, glabrous, tomentose, or woolly.

Herbs, shrubs, or trees; leaves various, entire or lobed, sometimes multipartite; flowers solitary, often showy, often with a dark centre and velvety or silky surface.

Species about 274, found in all warm countries; 40 species in South Africa, generally distributed.

5015

12. KOSTELETZKYA, Presl

Epicalyx of 7-10 segments, very small, sometimes 0. *Calyx* 5-fid or 5-toothed. *Staminal-column* entire or 5-toothed, bearing stamens on its outer surface. *Gynæcium* of 5 fused carpels, with a single ovule in each ovary; styles as many as the carpels, capitate or dilated at the apex. *Fruit* an oblong depressed capsule, dehiscent loculicidally along the 5 projecting angles. *Seeds* reniform, ascending.

Herbs or shrubs, often hispid or scabrid; leaves entire or lobed; flowers shortly pedicelled in the axils of the upper leaves, or clustered at the apices of the branches.

Species about 14, natives of America, Africa, and the Mediterranean Region; doubtfully recorded from South Africa.

5018

13. THESPESIA, Corr.

Epicalyx of 3-8 segments, small or deciduous. *Calyx* truncate, minutely 5-toothed, rarely 5-fid. *Staminal-column* toothed, bearing stamens on its outer surface. *Gynæcium* of 5 fused carpels, with a few ovules in each ovary; style club-shaped at the apex, 5-furrowed or obscurely divided into stigmatic lobes. *Fruit* a woody capsule, indehiscent or loculicidally 5-valved. *Seeds* obovoid, glabrous or tomentose; cotyledons very much folded, enclosing the radicle, often black-dotted.

Trees or shrubs; leaves large, entire or lobed; flowers solitary, often showy, usually yellow.

Species about 11, found in all tropical countries; 2 species in Natal.

5019

14. CIENFUEGOSIA, Cav.

(*Fugosia*, Juss.)

Epicalyx of 3 to many segments, small or deciduous. *Calyx* 5-fid, black-dotted. *Staminal-column* truncate or toothed, bearing stamens on its outer surface. *Gynæcium* of 3-4 fused carpels, with 3 to many ovules in each ovary; style club-shaped at the apex, furrowed or divided into 3-4 club-shaped stigmas. *Fruit* a loculicidal 3-4-valved capsule. *Seeds* obovoid, glabrous, pubescent, or woolly; cotyledons bi-triplicate; auricles concealing the base of the straight radicle, not dotted; endosperm thin.

Shrubs or undershrubs; leaves entire or lobed, rarely partite; flowers solitary, often yellow.

Species about 36, natives of America, Australia, and Africa; 3 species in South Africa, found in the Transvaal, Natal, and S.W. Africa.

5020

15. GOSSYPIUM, Linn.

Epicalyx of 3 large cordate segments, covered with black dots. *Calyx* truncate or 5-fid, covered with black-dots. *Staminal-column* usually naked at the summit, bearing stamens on its outer surface below the summit. *Gynæcium* of 5 fused carpels, with many ovules in each ovary; style club-shaped at the apex, 5-furrowed and with 5 stigmas. *Fruit* a capsule, with loculicidal dehiscence. *Seeds* densely woolly.

Herbs or shrubs; leaves usually 3-9-lobed, rarely entire; flowers solitary, large, yellow or purple.

Species 10, natives of warm countries; 1 species found native in the Transvaal, but several varieties largely cultivated.

114. BOMBACACEÆ.

Flowers bisexual. *Epicalyx* 0. *Calyx* leathery, closed in the bud, or irregularly lobed, or truncate, or rarely deeply 5-fid. *Petals* 5, adhering to the base of the staminal-column, contorted in bud, sometimes absent. *Stamens* 5 or more, united below; staminal-column with filaments at the apex, or rarely divided into filaments to the base, rarely entire almost to the apex; anthers 1-theous. *Ovary* superior or nearly so, 5-10-chambered, with n any ovules in each chamber; style entire, or divided into very short branches as many as the ovary-chambers. *Fruit* a capsule or nut, very rarely separating into carpels. *Seeds* with scanty endosperm, and a curved embryo with folded or coiled cotyledons.

Trees; leaves alternate, digitately compound or simple; stipules present; flowers usually solitary, sometimes fascicled, or inflorescence a short raceme or a cymose umbel; bracts and bracteoles usually present.

Genera 21, with about 150 species, natives of Africa, Madagascar, India, Australia, America, and the Malay Archipelago.

5023

1. ADANSONIA, Linn.

Calyx cup-shaped, 5-cleft. *Petals* 5. *Staminal-column* dividing at the apex into many filaments; anthers reniform, terminal. *Ovary* 5-10-chambered, with many ovules in each chamber; style longer than the stamens, dividing above into as many stigmatic lobes as there are chambers in the ovary. *Fruit* oblong, woody, indehiscent, filled with pulp. *Seeds* reniform, embedded in the pulp; embryo curved; endosperm thin.

Trees, with a comparatively short trunk, acquiring an immense girth; the wood soft and spongy; leaves digitate; leaflets entire; flowers solitary, pedicelled, large, white, pendulous; bracts present.

Species 12, natives of Africa, Madagascar, and Australia; 1 species in the northern Transvaal.

115. STERCULIACEÆ.

Plants sometimes monœcious, or with occasional bisexual flowers. *Flowers* sometimes all bisexual, regular. *Epicalyx* present or absent. *Calyx* 5- (rarely 3-4-) cleft or parted, with valvate æstivation, very rarely sepals free. *Petals* 5, free or adnate at the base to the staminal-tube, with twisted æstivation, rarely petals 0. *Stamens* hypogynous, as many as the petals and opposite to them, sometimes twice or several times as many, all fertile or some barren; filaments connate at the base into a cup or tube; anthers 2-theous. *Gynæcium* often of 2-5 more or less free carpels, very rarely of 10-12 carpels or carpels reduced to one, with 2 to many ovules in each ovary-chamber, when the carpels are fused then the ovary superior; style entire, or divided into as many lobes as there are carpels or ovary-chambers, rarely of free styles. *Fruit* dry or rarely fleshy, often dividing into dehiscent or indehiscent carpels. *Seeds* never woolly; embryo straight or curved; endosperm fleshy, thin, or 0.

Herbs, shrubs, or trees, commonly with stellate pubescence often mixed with simple hairs; leaves alternate, very rarely sub-opposite, simple, entire, or lobed, or digitately 3-9-foliate; stipules usually present; inflorescence an axillary or terminal umbel or raceme, or cymose panicle, or reduced to a single flower.

Genera 51: species about 790; found in tropical countries of both hemispheres; abundant in South Africa and Australia.

Tribe **Dombeyæ**: Flowers bisexual; petals often persistent, flat; stamens joined to form a staminal-column, bearing anthers on the margin; anthers solitary or in groups alternating with staminodes (genera 1-2).

Tribe **Hermannieæ**: Flowers bisexual; petals marcescent, flat; stamens 5; the filaments joined at the base only, rarely joined to form a tube; staminodes 0, or rarely tooth-like (genera 3-4).

Tribe **Sterculieæ**: Plants monœcious, or with occasional bisexual flowers; calyx often coloured; petals 0; stamens 5-15; the filaments united to form a long or short tube, or almost free; anthers clustered or arranged in a ring (genera 5-6).

1. Leaves digitately compound 5. *Sterculia*, Linn.
Leaves simple, sometimes much cut 2
2. Plants monœcious, or with occasional bisexual flowers; petals 0
6. *Cola*, Schott
Flowers all bisexual; petals present 3
3. Ovary 1-chambered, with 2 ovules; stamens 5 4. *Waltheria*, Linn.
Ovary 2-5-chambered, with 1 to many ovules in each chamber;
stamens 5-20; staminodes sometimes present 4
4. Stamens 5, all fertile 3. *Hermannia*, Linn.
Stamens 10-20, some reduced to staminodes 5
5. Flowers solitary or 2-nate; fertile stamens 5 1. *Melhania*, Forsk.
Flowers in umbels or cymes; fertile stamens 10-15 2. *Dombeya*, Cav.

5047

1. MELHANIA, Forsk.

Flowers bisexual. *Epicalyx* 3-leaved, sub-unilateral, persistent. *Calyx* 5-partite. *Petals* 5, obovate, unequal-sided, convolute. *Stamens* 10; filaments connate at the base; 5 sterile and strap-shaped and shorter; anthers sagittate. *Ovary* 5-chambered, with 1 to several ovules in each chamber; style short; stigmas 5, spreading. *Fruit* a loculicidal capsule. *Seeds* with endosperm; cotyledons plicate.

Herbs or undershrubs, with the aspect of *Hermannia*; leaves alternate, simple, ovate or cordate, crenate; stipules narrow-subulate; flowers axillary, pedicelled, solitary or 2-nate.

Species about 42, natives of Africa and Asia; 16 species in South Africa, extending from the Transvaal, Zululand and Natal to the Uitenhage district; also found in the north-western districts and S.W. Africa.

5053

2. DOMBEYA, Cav.

Flowers bisexual. *Epicalyx* 3-leaved, unilateral, deciduous, sometimes wanting. *Calyx* 5-partite. *Petals* 5, obovate, unequal-sided, convolute, persistent. *Stamens* 15-20; filaments slightly connate at the base; 5 sterile, strap-shaped, or filiform and alternating with the petals; the rest shorter and in groups of 2-3 opposite each petal; anthers oblong. *Ovary* sessile, 2-5-chambered, with 2 ovules in each chamber; styles 5, distinct or connate below. *Fruit* a 3-5-locular capsule. *Seeds* ascending; cotyledons foliaceous; endosperm present.

Shrubs or small trees; leaves alternate, simple, cordate or lobed; inflorescence a cyme or umbel, often many-flowered; flowers rosy or white.

Species about 113, natives of Africa and Madagascar; 10 species in South Africa, extending from the Transvaal and Natal through the eastern districts to the Bathurst district; also found in the Queenstown district and S.W. Africa.

5056

3. HERMANNIA, Linn.

(Mahernia, Linn.)

Flowers bisexual. *Calyx* 5-fid. *Petals* 5, obovate or oblong, clawed, spirally twisted; claws with infolded margins. *Stamens* 5, opposite the petals; filaments connate at the base, or almost free, oblong, or obovate, or suddenly dilated and mostly tuberculated in the middle, or somewhat

cruciform. *Ovary* sessile or shortly stalked, 5-chambered, with many ovules in each chamber; styles 5, more or less connate. *Fruit* a 5-locular loculicidal capsule, nude or horned above. *Seeds* reniform; embryo curved; endosperm present.

Herbs, shrubs, or undershrubs, frequently with stellate pubescence; leaves alternate, simple, entire, toothed, or pinnatifid, often plaited; stipules foliaceous, rarely small or 0; flowers yellow, orange, cream-coloured, violet, or red, axillary or sub-terminal, solitary, or inflorescence a pseudo-raceme or panicle.

Species over 200, natives of Africa, Arabia, Australia, and South America; 153 species in South Africa, generally distributed.

5059

4. WALTHERIA, Linn.

Flowers bisexual. *Epicalyx* 3-leaved or wanting. *Calyx* 5-fid. *Petals* 5, spathulate, clawed, attached to the base of the staminal-tube. *Stamens* 5, opposite the petals; filaments connate at the base; anthers oblong. *Ovary* 1-chambered, with 2 ovules; style simple, lateral; stigma multifid. *Fruit* a 2-valved 1-seeded capsule. *Seed* ascending; embryo straight; endosperm present.

Herbs or shrubs, rarely small trees, with stellate and simple pubescence; leaves alternate, simple, serrate; stipules narrow; flowers small, usually in axillary clusters or small cymes.

Species about 38, chiefly tropical American; 1 species occurs in the Transvaal and Natal.

5083

5. STERCULIA, Linn.

Plants monœcious, or with occasional bisexual flowers. *Calyx* 4-5-cleft or -parted, often coloured. *Petals* 0. *Stamens* 10-15, consisting of anthers in a capitate head at the summit of a solid staminal-column. *Gynæcium* of 5 sub-distinct carpels, with 2 to many ovules in each ovary; style peltate or lobed at the apex. *Fruit* separating into distinct carpels, spreading horizontally; carpels woody or leathery, at length splitting longitudinally, or membranous or sub-foliaceous and opening early. *Seeds* 1 to several in each carpel, sometimes winged; cotyledons flat and thin; endosperm adhering to the cotyledons.

Trees; leaves alternate, petioled, simple or digitately compound (compound in both the South African species); stipules deciduous; inflorescence an axillary or sub-terminal panicle; flowers red, yellow, or partly coloured, pubescent or woolly.

Species about 90, found in all tropical countries, most abundant in Asia and Africa; 2 species in South Africa, 1 found in the northern Transvaal, the other in the Uitenhage district.

5091

6. COLA, Schott

Plants monœcious, or with occasional bisexual flowers. *Calyx* 4- (more rarely 5-6-) fid. *Petals* 0. *Stamens* 10-12, consisting of a column, sometimes very short, bearing 10-12 anthers arranged in a single row. *Gynæcium* of 4-10 (rarely 11-12) sub-distinct carpels, with many ovules in each ovary; styles as many as the carpels, short, filiform or dilated. *Fruit* separating into 4-5 leathery or woody oblong carpels; carpels many-seeded, at length splitting lengthwise. *Seeds* obovoid; cotyledons thick; endosperm 0.

Trees; leaves alternate, simple, entire or lobed; flowers in axillary clusters, or inflorescence a short cyme or sub-panicle.

Species about 130, natives of Africa; 1 species found in Natal and Pondoland.

116. OCHNACEÆ.

Flowers bisexual. *Sepals* 4-5, free or nearly so, imbricate. *Petals* 5, rarely 4-10, free, with imbricate or contorted æstivation. *Torus* usually ample. *Stamens* 4-10 to many, hypogynous or nearly so; filaments free or united to form a tube, sometimes very short; anthers 2-theous, opening by longitudinal slits or apical pores. *Ovary* superior, 2-10-lobed and 1-10-chambered, or gynæcium sometimes of more or less free carpels, with 1-2 or many ascending rarely pendulous ovules in each ovary or ovary-chamber; style simple, sometimes divided into as many lobes as there are chambers in the ovary. *Fruit* a drupe or capsule. *Seed* with fleshy endosperm, or endosperm 0; embryo large.

Shrubs or trees, rarely undershrubs; leaves alternate, simple, entire or toothed; stipules present; inflorescence a raceme or panicle, rarely flowers solitary.

Genera 23; species about 300, natives of tropical countries; mostly American.

5112

1. OCHNA, Linn.

Sepals 5, coloured, persistent. *Petals* 5-10, slightly larger than the sepals, obovate or oblong, deciduous, spreading. *Torus* thick, lobed or produced into a gynophore. *Stamens* many, shorter than the petals; filaments filiform, free; anthers oblong or linear. *Gynæcium* of 3-13 more or less distinct carpels, with a solitary ovule in each ovary; style simple or lobed at the apex. *Fruit* a drupe, more or less separating into distinct carpels. *Seed* erect; cotyledons thick.

Trees or shrubs; leaves alternate, simple, entire or serrate; stipules present; flowers yellow, solitary or 2-4-nate, or inflorescence a raceme or panicle; pedicels articulated.

Species about 109, natives of Asia and Africa; 10 species in South Africa, extending from the northern Transvaal and Natal, through the eastern districts to George; also found in the eastern O.F.S.

117. GUTTIFERÆ.*

Plants sometimes diœcious or with occasional bisexual flowers. *Flowers* sometimes all bisexual, regular. *Sepals* 2-6, rarely many, imbricate, sometimes in opposite pairs. *Petals* as many as the sepals, imbricate or contorted. *Stamens* indefinite, rarely definite and equalling or double the number of the petals, free, or all connate, or connate in bundles. *Staminodes* often present in female flowers. *Ovary* superior, 2 to many-chambered, rarely 1-chambered, with 1 to many ovules in each chamber; styles as many as the ovary chambers, free or connate. *Fruit* a capsule, or an indehiscent berry or drupe. *Seeds* straight or rarely curved, with or without an aril; embryo straight or curved; endosperm 0.

Herbs, shrubs, or rarely trees; leaves opposite, often decussate, rarely whorled, simple, entire, sometimes gland-dotted; stipules 0; flowers white, yellow, or rosy, terminal or axillary, solitary, or inflorescence a cymose-panicle, a trichotomous panicle, or rarely a raceme.

Genera 49; species over 800, widely dispersed in warm and temperate countries, especially in Asia and America.

* The family is separated by Hutchinson "The Families of Flowering Plants" into the families *Hypericaceæ* and *Guttifereæ*.

Tribe **Hypericææ** : Ovary with 2 or more ovules in each chamber ; fruit a capsule (genus 1).

Tribe **Garciniææ** : Ovary with a solitary ovule in each chamber ; fruit a berry (genus 2).

Calyx 5-parted ; branches terete 1. **Hypericum**, *Linn.*

Sepals 4, in opposite pairs ; branches distinctly angled 2. **Garcinia**, *Linn.*

5168

1. **HYPERICUM**, *Linn.*

Flowers bisexual. *Calyx* 5-parted ; segments equal or the two outer largest, imbricate. *Petals* 5, margined with black dots, twisted in bud. *Disc* glandular or 0. *Stamens* numerous, connate at the base into 3-8 bundles, rarely all free or all connate. *Ovary* sessile, 1-chambered, or imperfectly 3-5-chambered, with many ovules on parietal placentas, rarely ovules 2 or few ; styles free or united. *Fruit* a dry dehiscent capsule, rarely fleshy and indehiscent, with numerous, very rarely definite or solitary, seeds. *Seeds* not winged ; embryo straight, rarely incurved.

Herbs, shrubs, or undershrubs ; leaves opposite, simple, entire or serrate, very often pellucid-dotted ; stipules 0 ; inflorescence a cyme or panicle ; flowers yellow.

Species about 331, widely dispersed, especially in the northern hemisphere ; 5 species in South Africa, found in the Transvaal, Natal, and the eastern districts to Riversdale ; also recorded from Victoria East, Somerset East, and the eastern O.F.S.

5199

2. **GARCINIA**, *Linn.*

Plants dioecious, or with occasional bisexual flowers. *Sepals* 4, in opposite pairs. *Petals* 4, rarely 5, imbricate. *Male flowers* : *Stamens* indefinite, free, or all connate, or connate in 4 bundles ; anthers erect or peltate, opening by a circular rim or longitudinal slits. *Female or bisexual flowers* : *Staminodes* various, free or united. *Ovary* 2 to many-chambered, with a solitary ovule in each chamber ; stigma sessile, peltate, lobed, smooth or tuberculate. *Fruit* baccate. *Embryo* with minute cotyledons ; radicle thick.

Trees, usually with a yellow juice ; leaves opposite or in whorls of 3, leathery or sub-membranous ; flowers axillary or terminal, solitary or fascicled, or inflorescence a sub-panicle.

Species about 160, natives of tropical countries, especially tropical Asia ; 3 species in South Africa, extending from the northern Transvaal, through Zululand and Natal, to the Transkei.

118. **ELATINACEÆ.**

Flowers regular, bisexual. *Sepals* 2-5, free, imbricate. *Petals* 2-5, imbricate. *Disc* 0. *Stamens* as many or twice as many as the petals, hypogynous, free ; anthers versatile, 2-theous. *Ovary* superior, 2-5-chambered, with many axile ovules in each chamber ; styles 2-5, free, capitate at the apex. *Fruit* a septicidal capsule. *Seeds* straight or curved ; embryo conforming to the shape of the seed ; endosperm 0 or very thin.

Herbs or undershrubs, sometimes diffuse, sometimes found in wet places ; leaves opposite or rarely whorled ; simple, entire or serrate ; stipules in pairs ; flowers small, axillary, solitary or in fascicled cymes.

Genera 2 ; species about 35, widely dispersed in tropical and temperate countries.

5230

1. BERGIA, Linn.

Sepals 5, free, often with hyaline margins. *Petals* 5. *Stamens* 10, those opposite the petals shorter and sometimes deficient. *Ovary* 5-chambered ; styles 5, free. *Fruit* a 5-locular 5-valved capsule.

Prostrate herbs or undershrubs, often pubescent ; leaves opposite, entire or serrate ; flowers axillary, solitary or in fascicled cymes.

Species about 20, widely dispersed in tropical and sub-tropical countries ; 8 species in South Africa, found in the Transvaal, the north-western districts, Bechuanaland, and S.W. Africa ; also occurs in the Cape, Riversdale, and Uitenhage districts.

119. FRANKENIACEÆ.

Flowers regular, bisexual. *Calyx-segments* joined ; lobes 4-6, induplicate-valvate, persistent. *Petals* 4-6, free, long-clawed, twisted-imbricate, deciduous. *Stamens* generally 6, sometimes 4-5 or many, hypogynous, free, or connate at the base into a very short ring ; anthers versatile. *Ovary* superior, sessile, 1-chambered, with many ovules on long funicles in 2 rows ; style filiform, divided at the apex. *Fruit* a capsule, enclosed in the persistent calyx. *Seeds* ovoid or oblong ; embryo straight ; endosperm copious, mealy.

Perennial herbs or undershrubs, articulated at the nodes, often inhabiting salt-marshes or the sea-coast ; leaves small, opposite, alternate, or whorled, simple ; stipules 0 ; flowers solitary, fugaceous, or inflorescence a cyme.

Genera 5 ; species about 64, natives of Persia and South America ; widely spread in tropical and temperate countries.

5233

1. FRANKENIA, Linn.

Calyx tubular, 4-5-fid, ribbed and furrowed. *Petals* 4-5, usually furnished with a ligule. *Stamens* usually 6, more rarely 4-5. *Ovary* with 3-5 parietal placentas ; style 3-partite at the apex.

Small perennial herbs or undershrubs, with diffuse, rarely erect, wiry stems ; leaves small, heath-like, opposite, alternate, or fascicled ; inflorescence a terminal cyme.

Species about 24, widely distributed in tropical and temperate regions ; 3 species in South Africa, found in the Transvaal, the north-western districts, and S.W. Africa, and also in the Malmesbury district and through the south-eastern districts to East London.

120. TAMARICACEÆ.

Flowers regular, often bisexual. *Sepals* 5, rarely 4 or 6, free or connate at the base, strongly imbricate. *Petals* 4-5, inserted under a disc, imbricate, free, or joined to form a tube. *Disc* hypogynous or slightly perigynous, composed of 10 glands, crenate or angled, rarely obsolete. *Stamens* 5 to many, inserted on the disc, free or variously connate at the base ; anthers 2-theccous, versatile, often apiculate. *Ovary* superior, 1-chambered or imperfectly septate, with numerous ovules ; styles 3-5, free or connate, or the stigmas sessile. *Fruit* a capsule. *Seeds* erect ; embryo straight ; endosperm present, sometimes very thin or none.

Shrubs or undershrubs, rarely trees ; leaves small, alternate, simple, often scale-like, entire, often fleshy or punctate ; stipules 0 ; flowers solitary, terminal or axillary, sometimes inflorescence a spike, or a simple or branched raceme.

Genera 4 ; species about 90, natives of the Mediterranean Region, central Asia, India, Africa, and China.

5239

1. TAMARIX, Linn.

Flowers bisexual. *Sepals* 4-5, rarely 6, free. *Petals* as many as the sepals, free or slightly connate at the base. *Disc* glandular-crenate, angled or lobed. *Stamens* 4-10, rarely 11-12; filaments free. *Ovary* 1-chambered, with numerous ovules on parietal placentas; styles 3-4, rarely 2-5. *Fruit* a 3- (rarely 2-4-) valved capsule. *Seeds* with a terminal tuft of silky hairs; endosperm 0.

Shrubs or small trees; leaves minute, scale-like; flowers white or rosy; inflorescence a spike or dense raceme.

Species about 65, natives of southern Europe, Africa, central and tropical Asia, and east India; 2 species found in Namaqualand and S.W. Africa.

121. CANELLACEÆ.

Flowers bisexual, regular. *Sepals** 3, imbricate, persistent. *Petals* in 2 rows; outer 4-5, free, thick, imbricate, deciduous; inner 4-5, thin, imbricate, sometimes absent. *Stamens* 7-18, hypogynous; filaments united to form a tube; anthers 20 or fewer by abortion, linear, adnate to the outer surface of the staminal-tube, opening by longitudinal slits. *Ovary* superior, 1-chambered, with 2 to many ovules on 2-5 placentas; style short, thick; stigmas 2-5. *Fruit* an indehiscent berry. *Seeds* 2 to many; embryo short or curved; endosperm oily and fleshy.

Glabrous, often aromatic, trees; leaves alternate, simple, entire, gland-dotted; stipules 0; inflorescence a terminal or axillary cyme, or flowers solitary.

Genera 4; species about 10, natives of western India, North and South America, Africa, and Madagascar.

5256

1. WARBURGIA, Engl.

Sepals 3, sub-orbicular. *Petals* 10, in 2 rows; the outer petals twice as long as the sepals, obovate or obovate-spathulate, gland-dotted, imbricate; inner petals thinner and narrower than the outer, spathulate, gland-dotted. *Stamens* 10; staminal-tube equalling or sub-equalling the petals; anthers sessile on the upper part of the tube. *Ovary* elongate-oblong, ovules in a single row on 5 placentas; style enclosed in the staminal-tube or just protruding; stigma sub-capitate, truncate. *Fruit* (immature) with blackish-green leathery skin, with immersed glands.

Trees; leaves shortly petioled, shining above; flowers solitary, or inflorescence a small axillary cyme.

Species 3, all African; 1 species found in the northern Transvaal.

122. VIOLACEÆ.

Flowers bisexual, rarely with unisexual flowers on the same plant, regular or zygomorphic. *Sepals* 5, equal or unequal, imbricate. *Petals* 5, hypogynous or slightly perigynous, sometimes unequal, with the anterior larger and dissimilar, often spurred or saccate. *Stamens* 5, hypogynous or slightly perigynous; filaments short, free or more or less connate; anthers erect, sometimes sessile, with the connective often dilated and produced beyond the anther-thecae, opening by longitudinal slits, rarely by apical pores.

* By some authors regarded as 3-bracts, and the two rows of petals as a calyx and corolla respectively.

Staminodes 5 to many, outside the stamens, rarely absent. *Ovary* superior, sessile, 1-chambered, with 3 (rarely 4-5) parietal placentas and many (rarely 1-2) ovules; style often simple, sometimes thickened at the apex, or incurved with an anterior stigma, or subulate with a terminal stigma, rarely cut at the apex, or the stigmas sessile and distinct. *Fruit* a capsule, rarely an indehiscent berry. *Seeds* with a very short funicle; embryo often straight; endosperm fleshy, often copious.

Herbs, shrubs, undershrubs, or rarely trees; leaves alternate or rarely opposite, simple, entire or rarely cut; stipules foliaceous or small, sometimes deciduous; flowers axillary, solitary, or inflorescence a cymose raceme or panicle, rarely a simple raceme; bracteoles commonly 2.

Tribe **Alsodeiæ**: Petals sub-equal, with very short claws; staminodes 0; fruit a loculicidal capsule or a berry (genus 1).

Tribe **Violeæ**: Petals irregular, with the anterior petal different from the others; staminodes 0; fruit a loculicidal capsule (genera 2-3).

1. Petals sub-equal 1. **Rinorea**, *Aubl.*
 Petals unequal; the lowest petal much larger than the others and usually spurred or saccate at the base 2
2. Sepals unequal, not or scarcely produced at the base 2. **Hybanthus**, *Jacq.*
 Sepals nearly equal, produced at the base into ear-like lobes 3. **Viola**, *Linn.*

5262

1. RINOREA, *Aubl.*

(*Alsodeia*, Thouars)

Sepals sub-equal. *Petals* free, sub-equal, sessile or very shortly clawed, sometimes 5 times longer than the sepals. *Filaments* free or more or less connate into a tube; staminal-tube sometimes shortly pilose within; anthers with the connective produced beyond the thecæ. *Ovary* with 1 to many ovules on the placentas; style straight; stigma terminal. *Fruit* a capsule. *Seeds* sub-globose, glabrous or hairy.

Trees or shrubs; leaves opposite or alternate, simple, entire or serrate; flowers small, solitary, or inflorescence a terminal or axillary raceme or panicle.

Species about 100, found in almost all tropical countries; 3 species in South Africa, extending from the Transvaal, Zululand, and Natal to the Transkei.

5271

2. HYBANTHUS, *Jacq.*

(*Ionidium*, Vent.)

Sepals unequal, not or scarcely produced at the base. *Petals* free, unequal; the lowest petal much larger than the others, clawed, with the claw dilated and concave or shortly spurred or saccate at the base. *Filaments* free or connate into a ring; anthers sometimes sub-sessile, with the connective produced into a membranous appendage at the apex. *Style* incurved and club-shaped at the apex. *Fruit* a capsule. *Seeds* ovoid-globose.

Herbs, sometimes undershrubs; leaves alternate or rarely opposite, simple; flowers axillary, solitary or fascicled, or inflorescence a terminal raceme.

Species about 57, spread in all tropical and sub-tropical countries; 6 species in South Africa, extending from the Transvaal and Natal, through the Transkei to the Uitenhage district; also found in Bechuanaland.

5274

3. VIOLA, *Linn.*

Sepals nearly equal, produced at the base into earlike lobes. *Petals* unequal; the anterior petal spurred or saccate at the base. *Stamens* sometimes unequal, with the two lower often spurred at the base; anthers subsessile, with the connective produced into a membranous appendage. *Style*

capitate, club-shaped, or variously dilated above, almost straight, with the stigma terminal, or more or less recurved with the stigma anterior. *Fruit* a capsule. *Seeds* ovoid-globose, often shining.

Herbs, rarely undershrubs; leaves alternate, simple; stipules persistent, often leaf-like; flowers axillary, 1- (rarely 2-) nate.

Described species over 670, but possibly not all valid; natives of tropical, sub-tropical, and temperate countries; 4 species in South Africa, found in the south-western districts as far as Riversdale, and then in the Transvaal.

123. FLACOURTIACEÆ.*

Plants sometimes dioecious. *Flowers* regular, bisexual, often with unisexual flowers on the same plant. *Sepals* 2-7, free or connate into a tube which is sometimes adnate to the ovary; lobes imbricate or valvate. *Petals* as many as the sepals, rarely more or 0, imbricated or contorted, deciduous. *Stamens* definite or indefinite, hypogynous or scarcely sub-perigynous, often alternating with staminodes; filaments free, or more or less connate; anthers opening by longitudinal slits, rarely by apical pores. *Ovary* superior, more rarely half-inferior, or inferior, 1-chambered, or more or less incompletely 2- or more-chambered, with 1 to many ovules on 2-8 parietal, rarely axile, placentas; style simple, or styles free. *Fruit* a capsule or berry, 1 to many-seeded. *Seeds* usually small, sometimes furnished with an arillus; embryo straight; endosperm fleshy, rarely thin or 0.

Armed or unarmed trees or shrubs; leaves alternate, rarely opposite or whorled, simple, entire or toothed; stipules present or 0; flowers axillary or terminal, solitary, fascicled, or inflorescence a corymb, raceme, or panicle.

Genera 79; species about 550, found in all warm countries, especially the tropics.

Tribe **Oncobæ**: Plants dioecious, or with occasional bisexual flowers; sepals and petals strongly imbricate; petals more numerous than the sepals, larger, without scales; anthers linear (genera 2-3).

Tribe **Pangicæ**: Plants dioecious; petals with free or epipetalous scales (genus 4).

Tribe **Homaliæ**: Flowers bisexual; petals as many as or twice as many as the calyx-lobes, without scales; stamens as many as the sepals and petals (genera 7-8).

Tribe **Flacourtiæ**: Flowers bisexual or unisexual; petals 0 or a little larger than the sepals, never more numerous, without scales, imbricate; stamens more numerous than the sepals; anthers short or rarely linear (genera 1, 5, 6, 9-12).

- | | |
|--|--|
| 1. Leaves opposite | 6. Pseudoscolopia , <i>Phill.</i> |
| Leaves alternate | 2 |
| 2. Ovary more or less completely 4-chambered, with 2 ovules in each chamber | 12. Flacourtia , <i>Commers.</i> |
| Ovary 1-chambered; if 2-3-chambered then the flowers unisexual | 3 |
| 3. Petals with a fleshy gland at the base within, or staminodes petaloid with a fleshy gland | 4 |
| Petals and staminodes, when present, without glands | 5 |
| 4. Stamens numerous; staminodes petaloid with a large basal gland | 1. Rawsonia , <i>Harv.</i> |
| Stamens 8-10; staminodes 0; petals with a gland within | 4. Kiggelaria , <i>Linn.</i> |
| 5. Receptacle pilose | 5. Scolopia , <i>Schreb.</i> |
| Receptacle glabrous | 6 |
| 6. Stamens equalling the number of sepals | 7 |
| Stamens more than the number of sepals | 8 |

* Separated by Hutchinson "The Families of Flowering Plants" into the families *Flacourtiaceæ* and *Samydaceæ*.

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|---|---------------------------------|
| 7. Sepals and stamens 5 | 7. <i>Gerrardina</i> , Oliv. |
| Sepals and stamens 7-9 | 8. <i>Homalium</i> , Jacq. |
| 8. Petals large, conspicuous and coloured | 9 |
| Petals, when present, small and resembling the sepals | 10 |
| 9. Armed trees or shrubs; fruit globose, indehiscent, with many
placentas and numerous seeds | 2. <i>Oncoba</i> , Forsk. |
| Unarmed trees or shrubs; fruit ovoid or ellipsoid, opening by
4-6 valves; seeds few | 3. <i>Xylothea</i> , Hochst. |
| 10. Stamines present | 14. <i>Casearia</i> , Jacq. |
| Stamines absent | 11 |
| 11. Petals 3-5 | 9. <i>Trimeria</i> , Harv. |
| Petals 0 | 12 |
| 12. Flowers unisexual | 13. <i>Doryalis</i> , E. Mey. |
| Flowers bisexual | 13 |
| 13. Unarmed plants; flowers solitary | 11. <i>Neumannia</i> , A. Rich. |
| Spiny plants; flowers clustered, rarely inflorescence a raceme | 10. <i>Xylosma</i> , Forst. |

5275

1. RAWSONIA, Harv.

Flowers bisexual, or unisexual by abortion. *Calyx* 4-5-parted; segment very unequal, concave, imbricate, persistent. *Petals* 4-5, unequal, concave, imbricate, deciduous. *Stamens* numerous, in several rows; the inner hypogynous; the outer attached to the base of the stamines. *Stamines* (or petaloid scales) opposite the petals and longer than them, hypogynous, each with a 2-lobed fleshy gland at the base. *Ovary* superior, on a convex torus, 1-chambered, with many ovules on 4-5 parietal placentas; style almost none; stigma sub-sessile, 4-5-parted. *Fruit* a light green globose berry.

Shrub or small tree; leaves alternate, simple, leathery, toothed; flowers axillary, solitary or clustered.

Endemic; species 1, extending from the northern Transvaal and Natal, to the Transkei.

5284

2. ONCOBA, Forsk.

Flowers bisexual, with occasional unisexual flowers on the same plant. *Sepals* 3 or 4, free or cohering below, imbricate. *Petals* 5-10 or more, rarely fewer, often narrowed towards the base and exceeding the sepals, imbricate. *Stamens* indefinite, free; anthers linear, 2-theous, basifixed, erect, opening at the sides. *Ovary* superior, 1-chambered, with 5-10 parietal placentas; style simple; stigma various. *Fruit* globose, indehiscent, many-seeded. *Seeds* with a horny testa; embryo with leafy cotyledons.

Trees or shrubs, armed with spines; leaves alternate, simple; flowers terminal or axillary, solitary, fascicled, or inflorescence a raceme.

Species about 21, found in Brazil and Africa; 1 species occurs in the northern Transvaal and Natal.

5284a

3. XYLOTHECA, Hochst.

Characters of *Oncoba*, but unarmed trees with an ellipsoid fruit which opens by valves and contains few seeds.

Species about 10, found in Brazil and Africa; 3 species occur in Zululand and Natal.

5296

4. KIGGELARIA, Linn.

Plants diœcious. *Calyx* 5-parted; segments valvate, deciduous. *Petals* 5, imbricate, each with a fleshy gland at the base inside. *Stamens* 8-10, crowded in the centre of the flower; filaments short; anthers hard and dry, 2-theous, opening by terminal pores. *Ovary* sessile, 1-chambered, with

numerous ovules on 2-5 parietal placentas ; styles 2-5, short. *Fruit* a globose pubescent leathery many-seeded capsule, opening imperfectly by 2-5 valves.

Unarmed shrubs or small trees ; leaves alternate, simple, petioled ; stipules 0 ; male flowers in axillary cymes, with long pedicels ; female flowers pedicelled, solitary.

Species 6, all African ; 3 species occur in South Africa, extending from the Transvaal and Natal, through the coastal belt to the Cape ; also recorded from Burghersdorp, Queenstown, and the eastern O.F.S.

5304

5. SCOLOPIA, Schreb.

(Phoberos, Lour.)

Flowers bisexual. *Calyx* persistent, with a short conical tube and 4-6-parted, slightly imbricate or sub-valvate. *Petals* 4-6, similar to the sepals. *Disc* fleshy, with glands on the margins opposite the calyx-lobes. *Stamens* many, in several rows, within the margin of the disc ; filaments filiform, often surrounded at the base with long hairs ; anthers 2-theecous, often apiculate at the apex. *Ovary* superior, 1-chambered, with few ovules on 3-4-placentas ; style simple ; stigma sub-capitate, or 2-5-lobed. *Fruit* a 2-4-seeded fleshy berry. *Seeds* suspended from a long funicle ; cotyledons foliaceous.

Armed or unarmed shrubs or small trees ; leaves alternate, simple, entire or toothed ; inflorescence a small axillary lax raceme, rarely a dense cylindric spike.

Species about 34, natives of Africa, Asia, and Australia ; 5 species in South Africa, extending from the Transvaal, Zululand, and Natal, through the coastal belt to the Cape.

5304a

6. PSEUDOSCOLOPIA, Phillips

Flowers bisexual. *Calyx* of 4 segments, valvate in bud, persistent. *Petals* 4, sub-similar to the sepals, imbricate in bud, persistent. *Stamens* many ; filaments free ; anthers erect in the bud. *Ovary* superior, 1-chambered, with 2 parietal placentas and a single ovule on each placenta ; style terete, bilobed at the apex. *Fruit* a 2-valved capsule, ovoid, acuminate, tipped with the remains of the persistent style. *Seed* ellipsoid, covered with stellate hairs ; embryo straight, with leafy cotyledons ; endosperm sparse.

Small trees ; leaves opposite, petioled, serrate, rarely sub-entire ; stipules 0 ; flowers in lax cymes, shorter than the leaves.

Endemic ; species 1, recorded from Pondoland. (Type species *P. Fraseri*, Phill.)

5312

7. GERRARDINA, Oliv.

Flowers bisexual. *Calyx* campanulate, 5-fid ; tube short ; lobes imbricate, unequal, with the 2 outer shorter and rounded and broadly elliptic. *Petals* 5, shorter than the calyx and alternating with its lobes, inserted on the margin of the disc, ovate, rounded, broadly cuneate at the base, deciduous. *Disc* lining the calyx-tube, with the margin broadly 5-crenate. *Stamens* 5, opposite the petals, inserted on the margin of the disc ; filaments subulate ; anthers introrse, with projecting connectives. *Ovary* superior, 1-chambered, with 4 pendulous ovules ; styles short, subulate. *Fruit* dry, 1-seeded.

A shrub or small tree ; leaves alternate, simple, serrate ; inflorescence a few-flowered axillary cyme.

Endemic ; species 1, extending from Pondoland to the northern Transvaal.

5313

8. HOMALIUM, Jacq.

(Blackwellia, Comm.)

Flowers bisexual. *Calyx-tube* turbinate, connate at the base with the ovary ; lobes 7-9, persistent. *Petals* 7-9, inserted in the calyx-throat, free, larger than the sepals, persistent. *Stamens* as many as the petals and opposite them and alternating with glands ; filaments filiform ; anthers small, didymous. *Ovary* semi-superior, 1-chambered, with few to many ovules on 2-5-parietal placentas ; styles 2-5, filiform ; stigmas simple or capitate. *Fruit* a semi-superior capsule, leathery, 1- or few-seeded, opening at the apex by 2-5 valves.

Shrubs or trees ; leaves alternate, simple, petioled, ovate or lanceolate, glandular-crenate or serrate, rarely entire ; stipules small or rarely deficient ; inflorescence an axillary raceme or panicle.

Species about 107, found in all tropical countries ; 3 species found in Natal and the Transkei.

5315

9. TRIMERIA, Harv.

Plants dioecious. *Male flowers* : *Sepals* 3-5, scarcely imbricate. *Petals* 3-5, larger than the sepals, imbricate. *Disc* bearing marginal glands opposite each of the sepals. *Stamens* 9-12, perigynous, inserted in parcels of 3-4, alternating with the glands of the disc ; filaments hairy. *Female flowers* : *Sepals* and *petals* as in the male. *Ovary* superior, 1-chambered, with 1-2 ovules on 3 parietal placentas ; styles 3, short, persistent. *Fruit* a dry capsule, 1-2-seeded, 3-valved.

Shrubs or trees ; leaves alternate, simple, toothed ; stipules 0 ; flowers minute ; inflorescence an axillary spike or panicle.

Species 4, all African ; 2 species in South Africa, extending from the northern Transvaal and Natal, through the eastern districts to George ; also recorded from Queenstown and Victoria East.

5320

10. XYLOSMA, Forst.

Flowers unisexual, or bisexual (in the S.A. species). *Sepals* 4-5, scale-like, often ciliate, imbricate. *Petals* 0. *Disc* annular, surrounding the stamens, sometimes with large glands opposite the sepals. *Stamens* many ; filaments free ; anthers short, versatile. *Ovary* situated on the disc, sometimes densely hairy, 1-chambered, with 2 or more pendulous ovules on 2, rarely 3-6, parietal placentas ; style entire or more or less divided ; stigma dilated, or rarely sub-sessile and peltate-lobed. *Fruit* an indehiscent berry, 2-8-seeded. *Seeds* obovoid ; cotyledons broad.

Trees or shrubs, often spiny ; leaves alternate, simple, usually toothed, more rarely entire ; flowers clustered in the axils of the leaves, or rarely inflorescence a short raceme.

Species about 54, found in almost all tropical countries ; 1 species found in the Stutterheim and Komgha districts.

5326

11. NEUMANNIA, A. Rich.

(Aphloia, Benn.)

Flowers bisexual. *Sepals* 4-5, broadly imbricate. *Petals* 0. *Stamens* many, inserted outside a glandular disc ; anthers short, without appendages. *Ovary* superior, 1-chambered, with a few ovules on a single placenta ; style very short ; stigma broadly peltate.

Trees or shrubs ; leaves alternate, simple, serrate or rarely incised ; flowers axillary, sessile or shortly pedicelled.

Species 5, natives of Africa, Madagascar, the Mascarene and Seychelles Islands ; 2 species found in the Transvaal.

5327

12. FLACOURTIA, Commers.

Flowers bisexual, or with occasional unisexual flowers on the same plant. *Calyx* 4-5-7-partite; lobes sometimes unequal, imbricate. *Petals* 0. *Male flowers*: *Stamens* very numerous; anthers small, oval or sub-didymous, attached at the back and opening by longitudinal slits, not appendaged. *Ovary* 0. *Female flowers*: *Stamens* 0 or few. *Ovary* surrounded by an annular or interrupted disc, usually more or less 4-8-chambered, with 2 superposed ovules (the upper ascending, the lower pendulous) in each chamber; the upper and lower ovules separated at length by spurious dissepiments; styles 4-8, more or less radiating, persistent; stigmatic apices retuse or emarginate. *Fruit* a berry, 8-16-locular (in the African species), with the loculi in two series one above the other. *Seed* obovoid; cotyledons orbicular.

Trees or shrubs, often spiny; leaves alternate, simple; flowers small; inflorescence a terminal or axillary raceme or small panicle, or the flowers fascicled, or the female flowers often solitary.

Species about 23, natives of Asia and Africa; 1 species occurs in the northern Transvaal; another species doubtfully recorded from Zululand.

5328

13. DORYALIS, E.Mey.

(*Dovyalis*, E.Mey.; *Aberia*, Hochst.)

Plants dioecious. *Male flowers*: *Calyx* 4-5-parted; segments scarcely imbricate. *Petals* 0. *Stamens* 12-20-merous, often inserted on a glandular disc; filaments filiform or very short; anthers didymous, erect, basifixed. *Female flowers*: *Calyx* 5-7-parted, sometimes with stalked glands on the margin. *Ovary* superior, 1-2- (rarely 3-) chambered, the dissepiment sometimes incomplete, with 1-6 ovules on 2-6 placentas; styles 2-3, divergent. *Fruit* a 1-2-seeded berry. *Seeds* glabrous or woolly.

Shrubs or small trees, often spiny; leaves alternate, simple, entire or toothed; flowers axillary; the male fascicled, the female solitary.

Species about 17, natives of Asia and Africa; 7, possibly 8, species in South Africa, extending from the Transvaal, Zululand, and Natal through the coastal belt to George.

5343

14. CASEARIA, Jacq.

Flowers bisexual. *Calyx-tube* short or sub-elongated; lobes 4-6, imbricate. *Petals* 0. *Stamens* 6-15, rarely 20-40, inserted on the tube or at the base of the calyx; filaments free or connate at the base among themselves and with the staminodes; connective of anthers sometimes penicillate at the pex. *Staminodes* alternating with the stamens. *Ovary* superior, 1-chambered, with many ovules on 3-4 parietal placentas; style short; stigma capitate, or stigmas 3. *Fruit* a sub-fleshy or dry capsule, many-seeded, opening by 3-4 valves. *Seeds* oblong or angled, with a fleshy arillus; embryo straight.

Trees or shrubs; leaves alternate, simple, entire, serrate, or with sub-spinose teeth; stipules small; flowers fascicled, rarely solitary, or inflorescence an umbel.

Species about 193, found in all tropical countries; 2 species in South Africa, found in Zululand and the Transkei.

124. TURNERACEÆ.

Flowers regular, bisexual. *Calyx* deciduous, tubular, 5-fid, or sepals almost free, imbricate. *Petals* 5, clawed, hypogynous, or inserted in the throat of the calyx-tube, deciduous. *Stamens* 5, alternating with the petals; filaments free; anthers versatile. *Ovary* superior, 1-chambered, with many ovules on 3 parietal placentas; styles 3, sometimes 2-cleft; stigmas nearly entire or multifid. *Fruit* a loculicidal capsule, dehiscing throughout its whole length or only to the middle. *Seeds* with an aril, pitted; embryo large; endosperm copious.

Herbs, shrubs, or undershrubs; leaves alternate, simple, entire, lobed, or pinnatifid, often with 2 glands at the base; stipules small or 0; flowers axillary, solitary or in few-flowered clusters, more rarely inflorescence a cyme or raceme; peduncle free or adnate to the petiole; bracteoles often present.

Genera 7; species over 100, natives of Africa, America, Madagascar, the Malay Archipelago, and the Seychelles Islands.

Calyx tubular 1. *Wormskioldia*, Schum. & Thonn.

Calyx campanulate; sepals almost free 2. *Piriqueta*, Aubl.
Stelepetalum Hance. *Shyil-tunk*. *Son-Bud-Dang* Vell.

5355

1. WORMSKIOLDIA, Schum. & Thonn.

Calyx tubular, 5-toothed. *Petals* obovate, clawed, inserted in the calyx-tube, with a scale near the base of the claw. *Stamens* hypogynous; filaments thread-like; anthers oblong. *Ovary* linear-oblong; styles 3, filiform; stigmas small, dilated, fimbriated. *Fruit* a short or elongated capsule, opening by 3 valves. *Seeds* numerous, ascending, cylindric, with a 1-sided membranous arillus; embryo straight; endosperm fleshy.

Glabrous or hispid herbs; leaves alternate, sessile or petioled, entire or lobed; stipules minute or 0; flowers yellow; inflorescence a raceme; bracts present.

Species 8, all African; 4 species found in the Transvaal.

5357

2. PIRIQUETA, Aubl.

(Under *Turnera*, Linn.)

Sepals 5, free, or united at the base only. *Petals* alternating with the sepals, twisted in aestivation, deciduous. *Filaments* flat, subulate; anthers oblong. *Styles* 3; stigmas expanded, multifid. *Fruit* a capsule, opening from the top to the middle only. *Seeds* with a one-sided crenate aril; embryo cylindric; endosperm fleshy.

Herbs, shrubs, or undershrubs; leaves alternate, simple, serrate or sub-pinnatifid, without basal glands, but sometimes with small glands on the margins; flowers erect, solitary, or inflorescence a cyme.

Species about 84, natives of America, Africa, and Madagascar; 1 species occurs in the Transvaal.

125. PASSIFLORACEÆ.

Flowers bisexual or unisexual. *Calyx-tube* short or elongated; lobes 3 to many, valvate or imbricate. *Petals* 0, or as many as the calyx-lobes, free, imbricate. *Corona* simple or double, tubular or cut into erect or radiating threads, rarely 0. *Stamens* 3-5, rarely many, in few to many series, perigynous or inserted with the petals; filaments free or connate.

Ovary superior, 1-chambered, with many, rarely few, pendulous ovules on 3-5 parietal placentas and in 1 to many rows; styles or stigmas as many as the placentas. *Fruit* a capsule or berry, dehiscent or indehiscent, many-seeded. *Seeds* often ovate, compressed, with a fleshy arillus, or with a pulpy integument; embryo large, often with leaf-like cotyledons; endosperm fleshy.

Herbs, shrubs, or trees, with various habit, often climbing and furnished with tendrils; leaves alternate, rarely opposite, petioled, simple, lobed or palmately 3-7-foliate, very rarely pinnate, often glandular at the apex of the petiole; stipules 0 or in pairs; flowers often showy, solitary, or inflorescence a raceme or a cymose panicle; pedicel often articulated under the flower; bracts often 3.

Genera 11; species about 400, natives of America, Africa, Australia, Madagascar, and New Zealand; some are widely dispersed.

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|--|---------------------------------|
| 1. Flowers unisexual | 3. <i>Adenia</i> , Forsk. |
| Flowers bisexual | 2 |
| 2. Ovary on a long stalk; flowers very large and showy | 4. <i>Passiflora</i> , Linn. |
| Ovary sessile or shortly stalked; flowers not large and showy | 3 |
| 3. Inflorescence a raceme; stamens twice as many as the calyx-segments | 1. <i>Schlechterina</i> , Harms |
| Flowers solitary or 3-4-nate; stamens 5 | 2. <i>Tryphostemma</i> , Harv. |

5363a

1. SCHLECHTERINA, Harms

Flowers bisexual. *Receptacle* very short, broad. *Sepals* 3-4, broadly ovate, obovate, or sub-orbicular, with the margins imbricate. *Petals* 3-4, similar to the sepals, but shorter and narrower and more membranous. *Corona* simple, of numerous unequal threads in 1 row. *Stamens* 6-8; filaments short, shortly connate at the base; anthers large, sagittate, dorsifixed. *Ovary* very shortly stalked, narrowed slightly towards the apex, with numerous ovules on 4 placentas; stigmas sub-sessile, thick, capitate.

A glabrous shrub, with more or less elongated axillary tendrils; leaves dimorphic; the lower linear, divided into segments which are truncate above; upper leaves petioled, simple, oblong or lanceolate, narrowed at the base into a petiole, entire or crenate-undulate; petiole glandular above; inflorescence an axillary raceme, many- or densely-flowered; bracts lanceolate.

Endemic; species 1, recorded from Delagoa Bay.

5369

2. TRYPHOSTEMMA, Harv.

Flowers bisexual. *Calyx-tube* short; lobes 5-6, oblong-lanceolate or oblong-linear, obtuse. *Petals* 0, or petals 5, linear, equalling the calyx-lobes and much narrower. *Corona* simple or double, membranous; the outer corona in the double-coronate flowers fimbriate to the middle. *Stamens* 5; filaments filiform, free or adnate to the corona; anthers small or linear. *Ovary* sessile, with 3 or few ovules on 3-4 placentas; styles 3-4, filiform, or style 3-fid; stigmas capitate. *Fruit* a 3-4-valved capsule, 3 to few-seeded. *Seeds* compressed, with or without an arillus.

Herbs or shrubs, with or without tendrils; leaves alternate, petioled or sub-sessile, cordate or lanceolate, entire, slightly bilobed, or 3-5-lobed, dentate or serrate; stipules subulate, or filiform, or large and foliaceous; flowers axillary, solitary, or in clusters of 2-3, erect or drooping.

Species 16, all African; 5 species in South Africa, found in the Transvaal and Natal.

5370

3. ADENIA, Forsk.

(Modecca, Lam. ; *Ophiocaulon*, Hook. f.)

Flowers unisexual. *Male flowers*: *Calyx-tube* campanulate, turbinate, tubular, or ventricose, or very short ; lobes 4-5, short or elongated. *Petals* 4-5, inserted in the calyx-throat or deep in the calyx-tube, sometimes fimbriated or sub-serrated. *Corona* 0, or obscure, or represented by a filamentous or fimbriate ring. *Stamens* 4-5, almost hypogynous, sometimes with the same number of scales or glands opposite them ; filaments short or elongated, free or connate below ; anthers narrow, linear or oblong, with the connective often, sometimes scarcely, mucronate. *Ovary* rudimentary, small or absent. *Female flowers*: *Calyx* and *corolla* as in male but sometimes smaller. *Staminodes* 4-5. *Ovary* sessile or shortly stalked, with numerous ovules on 3 placentas ; style 0 or 3-fid ; stigmas reniform, capitate, or dilated. *Fruit* a leathery chartaceous or fleshy 3-valvate capsule, rarely indehiscent, many-seeded. *Seeds* compressed, with a fleshy arillus ; cotyledons foliaceous.

Herbs or shrubs, glabrous, often glaucous, furnished with tendrils ; leaves alternate, petioled, simple or digitately compound, entire, palmatilobed or pinnatifid, with 2 glands at the apex of the petiole ; inflorescence often a long-peduncled axillary cyme.

Species about 80, found in most tropical countries ; 9 species in South Africa, found in the Transvaal and Natal, but also recorded from Komgha.

5372

4. PASSIFLORA, Linn.

Flowers bisexual, very rarely unisexual. *Calyx-tube* short, urceolate ; lobes 4-5, linear-oblong or linear, often coloured within, often horned dorsally below the apex. *Petals* 4-5 or 0, sub-equalling the calyx-lobes, but more brightly coloured. *Corona* simple or double ; the outer of many filaments in 1-2 rows, or tubular and membranous ; the inner tubular or 0. *Gynophore* elongated. *Stamens* 4-5 ; filaments adnate to the gynophore but free above ; anthers linear-oblong, versatile. *Ovary* stalked, with many, rarely few, ovules on 3 placentas ; styles 3, sub-terminal, cylindric or club-shaped ; stigmas capitate. *Fruit* an ovoid or globose berry, dry or pulpy, many-seeded, sometimes sub-3-valved. *Seeds* ovate, compressed, furnished with an arillus ; cotyledons foliaceous.

Herbs or climbing shrubs, rarely erect, furnished with tendrils ; leaves alternate, rarely opposite, entire, lobed, or cut, with the petiole often glandular ; stipules 2 or 0 ; flowers often showy, axillary, solitary, or inflorescence a raceme ; pedicel articulated ; bracts often 3.

Species about 237, natives of America, Asia, Australia, and Madagascar ; several species cultivated in South Africa and found semi-wild as garden escapes.

126. ACHARIACEÆ.

Plants monœcious. *Calyx-tube* 0 ; segments free or almost free to the base, sometimes adnate to the corolla. *Corolla* campanulate, 4-5-lobed ; lobes imbricate. *Stamens* 3-5, inserted at the base or in throat of the corolla-tube and alternating with the corolla-lobes ; filaments free, sometimes adnate for part of their length to the corolla-tube ; anther-thecae more or less free and adnate to a broadened connective. *Glands* at the base of, or on the corolla-tube. *Ovary* superior, 1-chambered, with few to many ovules on 3-5 parietal placentas ; style 3-4-fid, or stigmas almost sessile. *Fruit* a capsule, sometimes enclosed in the persistent corolla. *Seeds* sometimes with an arillus ; embryo straight ; endosperm copious.

Herbaceous climbers, sub-herbaceous undershrubs, or acaulescent plants, without tendrils : leaves alternate, simple, sometimes palmately lobed, sometimes all radical, crenate or serrate, sometimes 3-7-lobed ; stipules 0 ; flowers usually solitary or 2-nate, or the male inflorescence a raceme.

Genera 3 ; species 3, all natives of South Africa.

1. An acaulescent plant with radical leaves ; flowers on long peduncles
3. Guthriea, Bolus
 Plants with evident stems ; flowers on short peduncles, or male
 inflorescence a raceme 2.
2. A slender climber ; leaves palmately 5-7-lobed, with the lobes shortly
 serrated 1. Ceratiosicyos, Nees
 A small undershrub, thinly pubescent ; leaves 3-lobed, with the lobes
 deeply serrated 2. Acharia, Thunb.

5374

1. CERATIOSICYOS, Nees

Male flowers : *Calyx-segments* 4-5, distinct from the base, linear, spreading. *Corolla* cylindric-campanulate, 4-5-lobed ; lobes oblong. *Stamens* 5, inserted at the base of the corolla, alternating with the same number of glands adnate to the corolla ; filaments linear, dilated upwards ; anther-thecae adnate to a club-shaped connective. *Ovary* 0. *Female flowers* : *Calyx* very inconspicuous. *Corolla* as in the male. *Staminodes* 0. *Ovary* stalked, with many ovules on 4-5 parietal placentas ; stigmas 4-5, sub-sessile, 2-lobed. *Fruit* an elongated capsule, 4-5-valved, several-seeded. *Seeds* with a fleshy integument ; embryo small.

A slender herbaceous nearly glabrous climber, without tendrils ; leaves alternate, palmately 5-7-lobed, membranous, serrate ; male flowers in racemes ; female flowers solitary.

Endemic ; species 1, extending from Port Elizabeth to Natal.

5375

2. ACHARIA, Thunb.

Male flowers : *Calyx-segments* 3-4, free from the base, small, ovate, recurved. *Corolla* campanulate, shortly 3-4-lobed, with the same number of glands opposite the lobes and adnate to the tube. *Stamens* 3-4 ; filaments adnate to the perianth for more than half their length, dilated upwards ; anther-thecae adnate to a broad bilobed connective, didymous. *Ovary* 0. *Female flowers* : *Calyx* and *corolla* as in the male, persistent, enlarged in fruit. *Ovary* sub-sessile, with 3 glands at the base, with few ovules on 3-4 parietal placentas ; style 3-4-fid ; stigmas 2-lobed. *Fruit* a capsule, enclosed in the persistent corolla, 3-4-valved, terminated by the persistent stigmas, few-seeded. *Seeds* globose ; cotyledons orbicular.

A small undershrub, sub-herbaceous, thinly pubescent ; leaves alternate, simple, petioled. 3-lobed, deeply serrated ; flowers solitary or 2-nate, shortly peduncled, nodding or pendulous.

Endemic ; species 1, extending from the Uitenhage district to the Transkei.

5376

3. GUTHRIEA, Bolus

Male flowers : *Calyx-segments* 5, almost distinct from the base, linear, adnate to the corolla for half their length. *Corolla* herbaceous, profusely veined, deeply campanulate, 5-fid ; lobes ovate, obtuse, reflexed. *Glands* at the base of the corolla. *Stamens* 5, inserted in the throat of the corolla ; filaments somewhat flattened ; anther-thecae adnate to a thick connective. *Female flowers* : *Calyx* as in the male, but very much shorter than the corolla. *Corolla* campanulate, shortly and obtusely 5-lobed ; lobes erect. *Glands* at the base of the corolla. *Ovary* sessile, with 10-15 ovules on 5 placentas ; styles 5, joined, erect ; stigmas 5, short, acute, channelled. *Fruit*

a capsule, enclosed in the corolla, 5-valved, 8-10-seeded. *Seeds* ellipsoid, furnished with an arillus ; embryo straight.

An acaulescent herb ; leaves radical or rosulate, alternate, simple, petioled, ovate or cordate, crenate ; flowers axillary, solitary, on long peduncles.

Endemic ; species 1, recorded from the Oudeberg in the Graaff-Reinet district, from the Wittebergen in the Barkly East district, and from the Mont-aux-Sources in Natal.

127. LOASACEÆ.

Flowers regular, bisexual. *Calyx-tube* adnate to the ovary, often ribbed ; lobes 4 or 5, imbricate or contorted, persistent, sometimes enlarged. *Petals* 4-5, free, inserted in the calyx-throat, sessile or clawed, flat or concave, induplicate-valvate. *Scales* cucullate, alternating with the petals, appendaged, or 0. *Stamens* many, rarely definite, inserted with the petals ; filaments often collected in bundles opposite the petals ; anthers oblong or didymous, opening by longitudinal slits. *Staminodes* filiform, petaloid, or 0, frequently 2-3-5-nate and opposite the cucullate scales. *Ovary* inferior, very rarely semi-superior, 1- (rarely 2-3-) chambered, with 1 or many pendulous ovules from the apex of the ovary or on parietal placentas ; style subulate, entire or 2-3-fid ; stigma pointed or obtuse, very rarely lobed and capitate. *Fruit* a capsule, 1- (very rarely 2-3-) locular, 3-5-valved at the apex or longitudinally 3-10-valved. *Seeds* often minute ; embryo straight endosperm fleshy or very rarely horny, sometimes absent.

Herbs, rarely shrubs, erect or twining, without tendrils, usually with rough bristly hairs ; leaves opposite or alternate, entire, lobed, incised-pinnatifid, or 2-3-pinnatifid ; stipules 0 ; flowers solitary, or inflorescence a raceme or cyme, rarely a head ; bracteoles 2.

Genera 13 ; species about 230, principally natives of South America.

5388

1. KISSENIA, R.Br.

Calyx-tube obconic, 10-ribbed, villous ; lobes 5, oblong-spathulate, equal, enlarged in the fruit. *Petals* 5, shorter than the calyx-lobes, concave, alternating with 5 petaloid inflexed 2-toothed scales. *Stamens* many ; filaments filiform ; anthers didymous. *Staminodes* many, linear, dilated and cordate at the base. *Ovary* 2-3-chambered, with a solitary apical pendulous ovule in each chamber ; style short, 2-3-fid ; stigmas simple. *Fruit* woody, ribbed, 2-3-locular, indehiscent, 1-3-seeded. *Seeds* linear-oblong, compressed ; embryo flat ; endosperm 0.

A robust undershrub, very scabrous and pale coloured ; leaves alternate, simple, petioled, 5-7-lobed and toothed ; flowers large ; inflorescence a terminal scorpioid cyme ; bracts present.

Endemic ; species 1, found in the north-western districts, Namaqualand, and S.W. Africa.

128. BEGONIACEÆ.

Plants monœcious. *Flowers* regular or zygomorphic. *Male flowers* : **Perianth-segments* 2 or more, petaloid or sepaloid ; the outer often 2, opposite, sepaloid, valvate ; the inner petaloid or 0. *Stamens* numerous ; filaments short, free or connate ; anthers linear-oblong or club-shaped, sometimes produced at the apex. *Ovary* 0 or rudimentary. *Female flowers* : *Perianth-segments* 2-5, rarely more, petaloid. *Staminodes* 0 or sometimes

* The outer whorl called "sepals" and the inner whorl "petals" by some authors.

represented by glands. *Ovary* inferior or rarely half-inferior, 2-3- (rarely 4 to many-, or 1-) chambered, very often 3-chambered and 3-winged or 3-angled, with very many ovules with axile placentation; styles 2-5, free, or connate at the base, very often 2-fid. *Fruit* a capsule, with loculicidal dehiscence, very rarely fleshy, many-seeded. *Seeds* minute; embryo obovoid or sub-cylindric; endosperm thin or 0.

Herbaceous plants, often succulent, or undershrubs; branches often swollen at the nodes; leaves alternate, very rarely sub-whorled, entire, lobed, or digitately partite; stipules 2, free, very often caducous; inflorescence a cyme; bracts and bracteoles present.

Genera 4; species over 400, chiefly natives of America, Asia, and Africa.

5397

1. BEGONIA, Linn.

Male flowers: *Outer perianth-lobes* 2, sepaloid; inner 2, petaloid, rarely more or 0. *Filaments* free or connate. *Female flowers*: *Perianth-segments* often 6, of which the 2 outer are larger and sepaloid. *Ovary* often 3- (rarely 2- or 4-5-) chambered, usually 3-winged; styles very often as many as the ovary-chambers, free, or connate at the base, 2-fid, with the lobes entire or cut. *Fruit* very often a capsule, 3-angled and unequally 3-winged, very rarely terete or 4-angled or baccate.

Herbaceous plants, often with fleshy stems, sometimes stemless; leaves alternate, simple, entire, lobed, or partite, irregularly toothed.

Described species about 741, with the same distribution as the family; 8 species found in South Africa, extending from the Transvaal and Natal, through the eastern districts to the Kei Mouth.

129. CACTACEÆ.

Flowers bisexual, regular, very rarely irregular. *Calyx-tube* adnate to the ovary; limb very short or produced into a tube beyond the ovary; lobes many, often numerous and in many rows, scale-like, foliaceous, or petaloid, imbricate. *Petals* many, often numerous and in many rows, free, or connate into a short tube; the outer not distinct from the calyx-lobes. *Stamens* very often numerous and in many rows, inserted in the calyx-throat, free, or adnate to the base of the petals; anthers small, oblong. *Ovary* inferior, 1-chambered, with many ovules on several parietal placentas; style elongated, terminal, simple; stigmas as many as the placentas. *Fruit* a fleshy berry or rarely dry, smooth or more or less spiny. *Seeds* numerous, shining or tubercled, often with a more or less furrowed testa; embryo curved; endosperm scant, copious, or 0.

Herbs, shrubs, or trees, with succulent stems, rarely epiphytes; stems depressed, globose, columnar, terete, or angled, or flattened, usually copiously furnished with spines; leaves usually rudimentary; flowers solitary or in clusters, often axillary or lateral.

Genera 21; species nearly 1,500, mostly South American.

Epiphytes; stems thin, terete; petals 6-10 . . . 1. *Rhipsalis*, Gaertn.

Succulent plants, with flat or thick cylindric stems; petals numerous

2. *Opuntia*, Mill.

5416

1. RHIPSALIS, Gaertn.

Calyx-tube not produced beyond the ovary; lobes 3 to many, very short, scale-like. *Petals* 6-10, oblong, spreading. *Stamens* numerous; filaments sub-equal; anthers short. *Ovary* exserted or immersed, smooth, very often

glabrous ; style filiform ; stigmas 2-6 or many, radiating. *Fruit* a sub-globose berry, smooth, crowned with the persistent perianth. *Seeds* almost pear-shaped ; cotyledons thick ; endosperm 0.

Fleshy shrubs, sometimes epiphytic ; stems terete or leaf-like, often jointed ; leaves scale-like ; flowers lateral, very rarely terminal.

Species about 50, natives of Africa, America, and Asia ; 1 species occurs in Pondoland.

5417

2. OPUNTIA, Mill.

Calyx-tube not produced beyond the ovary ; lobes numerous ; the outer scale-like or leaf-like, adnate to the ovary. *Petals* numerous, connate at the base, spreading. *Stamens* many, in many rows ; filaments shorter than the petals, connate among themselves. *Ovary* exserted ; style cylindric, scarcely exceeding the stamens ; stigmas 2-7, radiating. *Fruit* a pear-shaped berry, tuberculate. *Seeds* compressed ; cotyledons leaf-like ; endosperm scanty or copious.

Trees or shrubs, succulent, with jointed flat globose or sub-cylindric tuberculate stems, usually spiny ; leaves scale-like ; flowers lateral, solitary.

Species 252, natives of America ; several species naturalised in South Africa.

130. GEISSOLOMACEÆ.

Flowers regular, bisexual. *Perianth* 4-partite to the base, persistent ; segments ovate, mucronate, imbricate in bud, with the side sepals inside the others. *Stamens* 8, perfect, inserted at the base of the perianth ; filaments free, ligulate, rather shorter than the perianth ; anthers many times shorter than the filaments, bilobed at the base ; connective scarcely manifest. *Ovary* superior, 4-chambered, narrowly winged, with 2 collateral pendulous ovules in each chamber ; style pyramidal-acuminatè, easily separable into 4 parts and terminated by 4 very small stigmas. *Fruit* a capsule, 4-locular, dehiscing by 4 longitudinal sutures running down the wings of the loculi. *Seeds* by abortion solitary in each loculus ; endosperm fleshy.

A low shrub ; leaves decussate, sessile, entire, ovate, silky-pilose in bud, soon glabrous ; stipules 0 ; flowers apparently solitary, in reality in short much-reduced bracteate axillary racemes along the upper twigs ; bracts 6, decussate, persistent ; bracteoles present or 0.

Genus 1 ; species 1, South African.

5422

GEISSOLOMA, Lindl.

Characters of the Family.

Endemic ; only known from the Swellendam and Riversdale districts.

131. PENÆACEÆ.

Flowers regular, bisexual. *Perianth* 4-lobed, persistent, accrescent ; tube cylindric, rarely oblong and 4-ribbed ; lobes equal, valvate or reduplicate-valvate in the bud. *Stamens* 4, inserted in the throat of the perianth and alternating with its lobes ; filaments usually not longer than the anthers ; anther-thecae 2, adnate to the connective and often shorter than it. *Ovary* superior, 4-chambered, with 2 or 4 erect basal ovules in each chamber, or with 2 erect and 2 pendulous ovules in each chamber ; style terete and

terminated by a 4-lobed capitate stigma, or with 4 wings or angles topped by 4 oblong cruciform lobes and with 4 minute cushion-like stigmatic surfaces in the angles between the lobes below the apex of the style. *Capsule* loculicidal. *Seeds* by abortion 1-2 in each loculus; endosperm 0; funicle and raphe separable from the seed.

Small shrubs or undershrubs of an ericoid habit; leaves decussate, often imbricate, flat or rarely ericoid; stipules 0 or minute, sometimes glandular; flowers sessile or on very short pedicels, solitary or in much-reduced racemes, lateral or approximated at the ends of the branches; bracts leaf-like or differing from the leaves in colour and form; bracteoles opposite in one or more pairs, sometimes very caducous.

Genera 5; species 27, confined to the south-western area of the Cape Province.

Tribe **Penæa**: Ovules 2 or 4 in each chamber, basal, erect (in *Brachysiphon rupestris* occasionally 2 erect and 2 pendulous in each chamber) (genera 1-3).

Tribe **Endonemea**: Ovules 4 in each chamber, inserted half-way down on an axile placenta, 2 erect and 2 pendulous (genera 4-5).

1. Ovules 2 or 4 in each ovary-chamber, all basal, erect, very rarely 2 erect and 2 pendulous, but then ovary 4-angled 2
- Ovules 4 in each ovary-chamber, 2 erect and 2 pendulous; ovary cylindric 4
2. Ovary 4-angled; stamens shorter than the perianth-lobes 3
- Ovary cylindric; stamens exserted at the top of the perianth-tube
5. *Sarcocolla*, Linn.
3. Stigmatic surfaces 4, rather minute, cushion-like, in the angles between the lobes just below the apex of the style . . 3. *Penæa*, Linn.
- Stigma small, capitate, obscurely 4-lobed . . 4. *Brachysiphon*, A. Juss.
4. Flowers approximated at the tips of the branches; perianth-tube 4-ribbed; filaments very short 2. *Glischrocolla*, Endl.
- Flowers lateral; perianth-tube cylindric; filaments folded in bud, subulate above, ligulate below 1. *Endonema*, A. Juss.

5423

1. ENDONEMA, A.Juss.

Perianth-tube long, cylindric; lobes thickened to form a central ridge on the inner side, erect, becoming reflexed as the flower fades, valvate in bud. *Stamens* nearly as long as the perianth-lobes, or slightly longer; filaments subulate above, ligulate below; anther-thecae rather shorter than the connective. *Ovary* glabrous, with 4 ovules in each chamber (2 erect, 2 pendulous); style filiform; stigma obscurely 4-lobed.

Small erect shrubs or undershrubs; branches 4-angled or sub-4-angled in the younger parts; flowers lateral, solitary or apparently solitary, mainly in the axils of the upper leaves; bracts (bracteoles) in 2 or 3 pairs below each flower.

Endemic; species 2, extending from Caledon to the Uitenhage district.

5424

2. GLISCHROCOLLA, Endl.

Perianth-tube oblong, 4-ribbed; lobes erect, becoming reflexed in the faded flower, reduplicate-valvate in bud. *Stamens* shorter than the perianth-lobes; anthers cordate-ovate; the thecae with a membranous margin and longer than the connective. *Ovary* glabrous, with 4 ovules in each chamber (2 erect and 2 pendulous); style filiform; stigma obsolete 4-lobed.

Probably a low shrub with dichotomous branching; leaves ovate, close-ranked, passing into the bracts at the apex of the flowering shoot; flowers approximated at the tips of the branches; peduncles dichotomous.

Endemic; species 1, only known from the French Hoek Mountains.

5425

3. PENAEA, Linn.

Perianth-tube cylindric or ovate-cylindric, sub-equal to the bracts; lobes erect, valvate in bud. *Stamens* shorter than the perianth-lobes; filaments very short, flattened; anthers with a thick fleshy 2-lobed connective, bearing a small obliquely-placed theca on the inner side of each lobe near the base; margin of the valves fimbriate. *Ovary* 4-angled, glabrous or minutely scabrous, with 2-4 erect basal ovules in each chamber; style usually with 4 longitudinal membranous wings, or 4-angled, easily separable into 4 parts, with 4 flat oblong lobes, arranged in a cruciform manner at the apex of the wings, or style terete, with 4 longitudinal ridges at the base and 4 upright lobes at the apex; stigmatic surfaces in each case 4, rather minute, cushion-like, in the angles between the lobes just below the apex of the style.

Low much-branched undershrubs; branches 4-angled in the younger parts; flowers either lateral in the axils of leaf-like bracts, or approximated at the tips of the branches in the axils of the upper leaves; bracteoles usually 2, concave, shorter and narrower than the bracts.

Endemic; species 13, extending from Paarl to the Uitenhage district.

5426

4. BRACHYSIPHON, A. Juss.

Perianth-tube cylindric or ovate-cylindric, longer than or sub-equal to the bracts; lobes erect, or reflexing only in the faded flowers, reduplicate-valvate in bud. *Stamens* shorter than the perianth-lobes; anther-thecae adnate on a thick lobed connective and usually shorter than it. *Ovary* 4-angled, glabrous or minutely scabrous, with 2 or 4 basal erect ovules in each chamber, very rarely with 2 of the 4 ovules pendulous; style filiform, terete, cylindric; stigma small, obscurely 4-lobed.

Low much-branched undershrubs; branches 4-angled, or sub-4-angled in the younger parts; inflorescence a raceme, in the axils of the upper leaves, usually gathered in many-flowered terminal clusters, rarely solitary; bracts leaf-like, coloured; bracteoles 2, as long as or nearly as long as the bracts, but narrower.

Endemic; species 5, extending from Caledon to Swellendam.

5427

5. SARCOCOLLA, Linn.

Perianth-tube cylindric; lobes erect, becoming reflexed as the flower opens, reduplicate-valvate in bud. *Stamens* exerted at the top of the perianth-tube, projecting for their whole length. *Ovary* with 2-4 erect basal ovules in each chamber; style terete; stigma capitate, 4-lobed.

Much-branched undershrubs; upper branches often covered with a whitish waxy bloom; leaves flat, sessile, usually tipped with a more or less distinct gland; stipules small, pyramidal or auriculate, often glandular; inflorescence a terminal head, or flowers solitary and terminal; bracts imbricate, coloured, becoming resinous in the fruit; the lower sterile, tipped with a gland less prominent than that of the leaf; stipules with a gland at each side of their axil; bracteoles acute, acuminate or cuspidate-acute, entire, sometimes ciliate, shorter than the bracts.

Endemic; species 3, found in the Cape, Stellenbosch, and Caledon districts.

132. OLINIACEÆ.

Flowers bisexual. *Calyx-tube* adnate to the ovary; limb produced beyond the ovary, tubular, truncate, obscurely 5- (rarely 4-) toothed. *Petals* 5, rarely 4, inserted in the calyx-throat, obovate-spathulate or linear-spathulate, alternating with minute scales, valvate. *Stamens* 5, rarely 4, inserted

in the calyx-tube ; filaments very short, adnate to the tube ; anthers small, didymous. *Ovary* inferior, 3-5- chambered, with about 3 pendulous ovules in each chamber ; style straight ; stigma thickened. *Fruit* a drupe, truncate. *Seeds* oblong ; cotyledons irregularly convolute ; endosperm 0.

Trees or shrubs, with 4-angled branches ; leaves opposite, petioled, entire ; stipules 0 ; flowers small ; inflorescence a short trichotomous cyme, arranged in lax racemes.

Genus 1 ; species 8, all African.

5428

1. OLINIA, Thunb.

Characters of the Family.

Three species found in South Africa, extending from the northern Transvaal to the Cape through the coastal belt, but also recorded from the Queenstown district.

133. THYMELÆACEÆ.

Plants sometimes diœcious. *Flowers* bisexual (in the South African species), perigynous. *Calyx* 4-5-lobed ; tube (morphologically the enlarged receptacle) tubular, often swollen below, naked in the throat, or with 4, 5, 8, or 12 scales (petals) which are usually free, but sometimes united into a ring, sometimes with scales below the insertion of the stamens. *Stamens* 4, 8, or 10, usually in 2 whorls ; filaments usually very short ; anthers 2-theous, with introrse dehiscence. *Disc* usually absent in the South African genera, rarely cup-like. *Ovary* superior, 1-2-chambered, with a single lateral pendulous anatropous ovule in each chamber ; style long or short, ex-centric or central ; stigma capitate, penicillate, or small. *Fruit* dry or fleshy, indehiscent. *Seed* solitary, pendulous or laterally affixed ; embryo straight ; cotyledons fleshy ; endosperm fleshy, copious, scanty, or 0.

Trees, or large or small shrubs, with tough fibrous bark, rarely herbs ; leaves opposite, alternate, or scattered, entire, small and heath-like, or broader and pinnately nerved ; stipules 0 ; inflorescence usually a terminal sessile or peduncled head, short raceme, or spike, rarely the flowers axillary and solitary ; bracts present or 0.

Genera about 40, with about 400 species, found in tropical and South Africa, the Mediterranean Region, and Australia ; a few in Asia and North and South America.

Tribe *Phaleriæ* : *Ovary* 2-chambered, with a single ovule in each chamber (genus 1).

Tribe *Euthymelææ* : *Ovary* 1-chambered, with a solitary ovule (genera 2-10).

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| 1. <i>Ovary</i> 2-chambered ; inflorescence an umbel | 1. <i>Peddiea</i> , Harv. |
| <i>Ovary</i> 1-chambered ; inflorescence a head or spike, or flowers solitary | 2 |
| 2. <i>Stamens</i> 4 | 3. <i>Struthiola</i> , Linn. |
| <i>Stamen</i> 8 or 10 | 3 |
| 3. <i>Calyx</i> 5-lobed ; <i>stamens</i> 10 | 4 |
| <i>Calyx</i> 4-lobed ; <i>stamens</i> 8 | 7 |
| 4. <i>Throat</i> of calyx-tube naked | 5 |
| <i>Throat</i> of calyx-tube with separate scales (petals), or the scales united into a ring | 6 |
| 5. <i>Disc</i> cup-shaped ; <i>ovary</i> villous | 10. <i>Dais</i> , Linn. |
| <i>Disc</i> 0, or very small ; <i>ovary</i> glabrous | 2. <i>Gnidia</i> , Linn. |
| 6. <i>Calyx</i> not circumsessile, with the base becoming swollen and more or less fleshy in fruit ; scales united into a short erect entire or obscurely 5-lobed ring | 5. <i>Synaptolepis</i> , Oliv. |
| <i>Calyx</i> circumsessile at the base ; scales free | 2. <i>Gnidia</i> , Linn. |

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| 7. Throat of calyx-tube with scales (petals) | 8 |
| Throat of calyx-tube naked, or scales present but below the stamens | 9 |
| 8. Ovary villous | 4. Englerodaphne, Gilg |
| Ovary glabrous | 2. Gnidia, Linn. |
| 9. Scales present in the calyx-tube below the stamens | 10 |
| Calyx-tube without scales below the stamens | 11 |
| 10. Flowers solitary, terminal or in the axils of the upper leaves; scales in the middle of the calyx-tube | 6. Cryptadenia, Meissn. |
| Flowers in terminal bracteate or ebracteate heads, rarely solitary; scales next to throat of calyx-tube | 7. Lachnaea, Linn. |
| 11. Fruit a berry | 9. Chymococca, Meissn. |
| Fruit dry | 8. Passerina, Linn. |

5434

1. PEDDIEA, Harv.

Calyx 4-5-lobed, deciduous; tube sub-cylindric, naked in the throat; lobes short, spreading. *Stamens* 8 or 10, in two whorls. *Disc* cup-shaped, entire or lobed. *Ovary* shortly stalked, 2-chambered, with a single ovule in each chamber; style shortly filiform; stigma capitate or more or less saucer-shaped. *Fruit* not enclosed in the calyx, fleshy. *Seed* 1, rarely seeds 2; endosperm 0.

Glabrous shrubs; leaves alternate; inflorescence a terminal umbel.

Species 8, all African; 1 species found in South Africa, extending from the northern Transvaal, through Zululand and Natal, to Komgha.

5435

2. GNIDIA, Linn.

(including *Arthrosolen*, C.A.Mey. and *Lasiosiphon*, Fresen.)

Calyx 4-5-lobed; tube cylindric, slender, circumscissile above the ovary, glabrous or hairy, naked in the throat, or with 4, 5, 8, or 12 membranous or fleshy scales (petals) in the throat; lobes spreading. *Stamens* 8 or 10, in 2 whorls. *Disc* 0 or very small. *Ovary* sessile or sub-sessile, 1-chambered; style filiform; stigma small, capitate or penicillate. *Fruit* dry, enclosed in the persistent base of the calyx. *Seed* with scanty endosperm, rarely endosperm thick and fleshy, or endosperm 0.

Small or large shrubs, often heath-like; leaves opposite or alternate; inflorescence a terminal sessile or stalked head or spike, or the flowers solitary and axillary; bracts present or 0.

Species nearly 150, chiefly African, a few are found in Madagascar, and 1 species in India; 87 species occur in South Africa, generally distributed.

5436

3. STRUTHIOLA, Linn.

Calyx 4-lobed; tube slender, sometimes slightly inflated above, with 4, 8, or 12 erect thick fleshy scales (petals) in the throat in a single whorl, each scale surrounded by hairs; lobes spreading. *Stamens* 4, included. *Disc* 0. *Ovary* sessile, 1-chambered; style filiform; stigma capitate. *Fruit* dry, included in the persistent base of calyx. *Seed* with scanty endosperm.

Heath-like shrubs or undershrubs; leaves opposite or more rarely alternate, small, more or less imbricate; flowers sessile in the axils of the upper leaves, solitary, rarely geminate; bracteoles 2.

Endemic; species 41, extending from Van Rhynsdorp to the Uitenhage and Albany districts; also recorded from Pondoland, Calvinia, and Little Namaqualand.

5438

4. ENGLERODAPHNE, Gilg

Calyx 4-lobed ; tube sub-cylindric, slightly cylindric below the middle, not articulated, with 8 scales (petals) in the throat ; scales shorter than the calyx-lobes. *Stamens* 8 ; the upper slightly exserted. *Ovary* sessile, 1-chambered, very hispid ; style excentric.

A large shrub up to 10 ft. high ; leaves opposite ; inflorescence a terminal head ; bracts 0.

Endemic ; species 1, extending from Natal to East London ; also found in tropical Africa.

5442

5. SYNAPTOLEPIS, Oliv.

Calyx 5-lobed ; tube elongated, cylindric, at length swollen below, not articulated, with scales (petals) united into a short erect entire or obscurely 5-lobed ring at the throat ; lobes spreading. *Stamens* 10, in 2 distinct whorls. *Disc* shortly cup-shaped or of minute scales. *Ovary* shortly stalked, 1-chambered ; style long, slender ; stigma cylindric or capitate. *Fruit* dry, enclosed in the persistent more or less fleshy base of the calyx. *Seed* without endosperm.

Erect or climbing shrubs ; leaves alternate ; flowers solitary or fascicled in the leaf-axils, sessile or shortly stalked.

Species about 7, all African ; 2 species found at Delagoa Bay.

5459

6. CRYPTADENIA, Meissn.

Calyx 4-lobed ; tube cylindric or funnel-shaped, constricted and at length circumscissile above the ovary, naked in the throat ; lobes as long as or longer than the tube. *Stamens* 8, all or the 4 upper shortly exserted. *Scales* 8 to many, in a single series below the stamens. *Disc* 0. *Ovary* sessile, 1-chambered ; style filiform, sometimes thicker and hairy above. *Fruit* dry, included in the thinly membranous base of the calyx. *Seed* with fleshy endosperm.

Much-branched heath-like shrubs ; leaves decussate, small ; flowers solitary at the apex of the branches or in the axils of the upper leaves, often silky outside ; bracts 2.

Endemic ; species 5, extending from Clanwilliam to Bredasdorp ; also found in the Ceres district.

5460

7. LACHNÆA, Linn.

Calyx 4-lobed ; tube cylindric or constricted above the ovary, circumscissile, naked in the throat ; lobes spreading ; the outer usually larger. *Stamens* 8, usually shortly exserted. *Scales* 8, included in the calyx-tube below the stamens. *Disc* 0. *Ovary* sessile, 1-chambered ; style filiform ; stigma globose or ovoid. *Fruit* dry, enclosed in the persistent base of the calyx-tube. *Seed* with fleshy endosperm.

Small heath-like shrubs ; leaves opposite or scattered, usually small ; inflorescence a bracteate or ebracteate head, rarely flowers solitary.

Endemic ; species 19, extending from Clanwilliam to the Uitenhage district ; also found in the Ceres district.

5461

8. PASSERINA, Linn.

Calyx 4-lobed ; tube slender from an ovoid base, circumscissile above the ovary, naked in the throat ; lobes spreading, about as long as the tube. *Stamens* 8, inserted in the throat of the calyx-tube, exserted. *Disc* 0. *Ovary* sub-sessile, glabrous, 1-chambered ; style filiform ; stigma globose, papillate. *Fruit* dry, included in the persistent base of the calyx. *Seed* with fleshy endosperm.

Heath-like shrubs; leaves small, decussate; inflorescence a terminal spike; flowers in the axils of bracts (usually wider than the leaves).

Endemic; species 15, extending from Little Namaqualand through the coastal belt to the northern Transvaal.

5462

9. CHYMOCOCCA, Meissn.

Calyx 4-lobed; tube urceolate, constricted above the ovary, naked in the throat; lobes spreading. *Stamens* 8, fixed in the throat of the calyx-tube. *Disc* 0. *Ovary* sub-sessile, glabrous, 1-chambered; style filiform; stigma globose. *Fruit* a berry, included in the base of the calyx or not, striate. *Seed* with endosperm.

A heath-like shrub with the habit of *Passerina*; bracts not different from the stem leaves.

Endemic; species 1, recorded from the Van Rhynsdorp and Cape districts; also found near Port Alfred and Port Elizabeth.

5465

10. DAIS, Linn.

Calyx 5-lobed; tube cylindric, often curved, naked in the throat, silky; lobes spreading. *Stamens* 10, included, or the upper series of all shortly exerted. *Disc* hypogynous, cupular, membranous, truncate or toothed. *Ovary* villous, 1-chambered; style long, filiform; stigma ovoid or capitate. *Fruit* dry, enclosed in the base of the calyx. *Seed* without endosperm.

Shrubs; leaves opposite or scattered, often collected at the ends of the branches; inflorescence a dense terminal peduncled head; bracts 2-6, broad, forming an involucre.

Species 2, one in Madagascar and one in South Africa, extending from the northern Transvaal, through Natal and the eastern districts, to Komgha.

134. LYTHRACEÆ.

Flowers regular, rarely irregular, bisexual, very rarely sub-unisexual, 3-16-, more often 4-6-merous. *Calyx-tube* (morphologically the enlarged receptacle) shallow or tubular; lobes usually valvate; appendages alternating with the calyx-lobes evident or 0. *Petals* inserted in the calyx-throat and alternating with its lobes, rarely petals 0. *Stamens* inserted in the calyx-tube more or less remote from the petals, very rarely just below the petals, as many as the sepals, fewer or more numerous; anthers dors-, rarely basi-fixed. *Ovary* superior, 2-6-chambered, very rarely 1-chambered, with many to numerous ovules in each chamber; style simple or 0; stigma small, capitate, pointed or rarely bilobed. *Fruit* a capsule, dehiscent in various ways, rarely indehiscent. *Seeds* small; embryo straight; endosperm 0.

Annual or perennial herbs, undershrubs, shrubs, or trees; leaves mostly decussate, rarely whorled or alternate; stipules 2-10 or more, various, or 0; flowers solitary, or inflorescence a cyme, more rarely a panicle.

Genera 24, with over 450 species, numerous in warm regions, scarce in temperate regions, and absent in the arctic regions.

LYTHRÆÆ.—The dissippiments of the ovary broken above the placenta, and the style therefore not continuous with the placenta.

Tribe *Lythrinæ*: Seeds not margined, or if margined then the flowers zygomorphic; calyx often persistent (genera 1-3).

Tribe *Diplusodontinæ*: Seeds compressed and surrounded by a wing; flowers often actinomorphic (genus 4).

NESÆÆ.—The dissepiments of the ovary complete, therefore the style continuous with the placenta.

Tribe *Nesacinae* : Testa of seeds never thickened nor winged (genera 5-6).

The exact systematic position of *Rhynchoctylx*, Oliv. (genus 6) is somewhat uncertain.

1. Stem herbaceous, or woody at the base only ; leaves not dotted ; seeds not winged 2
- Stem woody ; leaves marked with black dots, rarely without dots, but then seeds with a thick wing 5
2. Fruit bursting transversely, or irregularly, or opening first by a small lid then splitting towards the base, enclosed in or partly exerted from the persistent calyx-tube 3
- Fruit opening longitudinally by 2-4-valves, not enclosed in the persistent calyx 4
3. Ovary 2-5-chambered below, with the partitions disappearing above 2. *Ammannia*, Linn.
- Ovary completely 2-5-chambered 5. *Nesæa*, Comm.
4. Fruit marked with dense, sometimes very faint, transverse veins 1. *Rotala*, Linn.
- Fruit without transverse veins 3. *Lythrum*, Linn.
5. Flowers solitary, sometimes in clusters, or head-like groups, or in cymes 5. *Nesæa*, Comm.
- Flowers in panicles 6
6. Calyx in bud produced into a long beak : petals long-clawed, with the blade toothed 6. *Rhynchoctylx*, Oliv.
- Calyx not long-beaked in bud ; petals shortly clawed ; blade not toothed 4. *Galpinia*, N. E. Br.

5473

1. *ROOTALA*, Linn.

Flowers 3-6-merous, sometimes dimorphic. *Calyx* semi-globose, campanulate or urceolate-tubular, scarious or very rarely herbaceous, 3-6-lobed ; lobes without an appendage or sometimes with a setiform appendage. *Petals* persistent, caducous, or 0. *Stamens* 1-6 ; filaments free. *Ovary* incompletely 2-4-chambered, with many small or very small ovules in each chamber ; style evident or almost none. *Fruit* a septicidal 2-4-valved capsule ; seeds very small.

Annual or rarely perennial herbs, aquatic or found in damp places ; leaves decussate or whorled, rarely alternate, simple ; flowers small, axillary and solitary, or rarely inflorescence a terminal spike or raceme, very rarely an umbel ; bracteoles usually 2, rarely 0.

Species 38, natives of Asia, Africa, Madagascar, Australia, and America ; doubtfully recorded from South Africa.

5474

2. *AMMANNIA*, Linn.

Flowers typically 5-merous, here and there 4-6-merous. *Calyx* campanulate or urceolate, herbaceous, 8-nerved, without appendages, or appendages short. *Petals* 0 or 1-4, fugacious, obovate or rounded. *Stamens* 2-8, very rarely up to 11 in 4-merous flowers, inserted on the calyx-tube. *Ovary* incompletely 2-4- (more rarely 5-) chambered or 1-chambered ; style longer than the ovary, or almost 0. *Fruit* a globose or ellipsoid capsule, included in the calyx-tube or exerted, opening transversely. *Seeds* very numerous, small.

Herbs, found in damp places, with the stem and branches more or less 4-angled ; leaves decussate, rarely sub-alternate, sessile, often cordate at the base ; inflorescence an axillary cyme.

Species about 20, natives of Africa, Asia, Australia, America, and Europe ; 3 species occur in the Transvaal.

5476

3. LYTHRUM, Linn.

Flowers 4-6- (more rarely 8-) merous. *Calyx* tubular, rarely broadly campanulate, with evident appendages, rarely appendages almost 0. *Petals* mostly large, rarely 0. *Stamens* 4-12, rarely 1, inserted on the calyx-tube. *Ovary* sessile or very shortly stalked, incompletely 2-chambered; style evident, rarely almost 0. *Fruit* a 2-valved capsule, with the valves often sub-bilobed. *Seeds* 8 to many, small.

Annual or perennial herbs, rarely sub-shrubby; leaves decussate, whorled, or alternate; flowers solitary or in few-flowered cymes.

Species 24, natives of America, Europe, Asia, Africa and Australia; 3 species found in South Africa; one common species recorded from the Cape to the Uitenhage district, otherwise confined to the Transvaal.

5480

4. GALPINIA, N.E.Br.

Flowers 5-6-merous. *Calyx* small, retuse at the base, membranous, obscurely 12-nerved; lobes about as long as the tube, deltoid, erect; appendages very short, plicate. *Petals* deciduous, shortly clawed, ovate-lanceolate, acute. *Stamens* 6, affixed on the calyx-tube; anthers sub-orbicular. *Ovary* sub-sessile, 2-chambered, with many ovules in each chamber; style thickened, subulate, about as long as the stamens; stigma pointed. *Fruit* (immature) a capsule, included within the calyx.

A small tree; leaves decussate, very shortly petioled; stipules fugacious; flowers small; inflorescence a terminal panicle.

Endemic; species 1, found in the Barberton district of the Transvaal.

5486

5. NESAEA, Comm.

Flowers 4-8-merous. *Calyx* turbinate-campanulate, campanulate, urceolate, or semi-globose, herbaceous; appendages 0, or short, or much longer than the lobes. *Petals* 1-8, deciduous, or 0. *Stamens* 4-23, in 1-2-rows. *Ovary* sessile, completely 2-5-chambered, with numerous ovules in each chamber; style short or long, or sometimes 0; stigma capitate or pointed. *Fruit* a globose or ellipsoid capsule, enclosed in the calyx, at first opening by a small operculum, and then irregularly cut. *Seeds* small.

Annual or perennial herbs, undershrubs, or shrubs, with more or less 4-angled stems; leaves decussate, or rarely sub-decussate, or whorled, or sometimes spiral, sessile or very shortly petioled; flowers axillary, solitary or in cymes, sometimes in clusters or head-like groups; bracts and bracteoles present.

Species 44, natives of Africa, Australia, Madagascar, eastern India and South America; 13 species in South Africa, found in the Transvaal, Zululand, and Natal; also recorded from East Griqualand, Komgha, Humansdorp, the eastern O.F.S. and S.W. Africa.

5495

6. RHYNCHOCALYX, Oliv.

Flowers 6-merous. *Calyx* globose in bud, with a long beak, deeply 6-fid; lobes lanceolate, acute. *Petals* 6, long-clawed; blade rounded or cordate at the base, with the margins toothed, sub-equaling the calyx. *Stamens* 6, opposite the petals; anthers broadly elliptic, opening by longitudinal slits. *Ovary* 2-chambered, with many ovules in each chamber; style passing into the ovary; stigma simple.

Small trees; leaves opposite, simple, shortly petioled, oblong-elliptic, entire; inflorescence a many-flowered terminal panicle, sometimes in the upper leaf-axils; panicles often exceeding the leaves; bracts obsolete.

Endemic; species 1, found in Natal.

135. LECYTHIDACEÆ.

Flowers bisexual. *Calyx-tube* ovoid or turbinate, not or scarcely produced beyond the ovary ; limb mostly divided into 4-6 (rarely 2-3) lobes, or more rarely cup-shaped or truncate, sometimes lobes cut, imbricate. *Petals* mostly 4-6, rarely 2-3, equal or unequal, free, or united into a campanulate tube, more rarely petals 0. *Disc* within the stamens, annular or wanting. *Stamens* many, in many series ; filaments united at the base ; anthers versatile, usually basifixed, opening by longitudinal slits. *Ovary* inferior, 2-20-chambered, with 2 or more inverted ovules in each chamber ; style short, simple, or 0 ; stigma simple or sub-capitate, sometimes divided into 4 lobes. *Fruit* woody, fibrous, or fleshy, indehiscent or with an operculum at the apex.

Trees or shrubs ; leaves alternate, simple, without glands ; stipules 0 ; flowers solitary, or inflorescence a raceme.

Genera 18 ; species almost 300, natives of the Dutch East Indies, India, Australia, South America, and Africa.

5506

1. BARRINGTONIA, Forst.

Calyx-tube ovoid or turbinate, not or scarcely produced above the ovary ; lobes 2-4, imbricate. *Petals* 4, very rarely 5 or 6, attached to the ring at the base of the stamens. *Stamens* numerous, in several rows ; filaments filiform, connate at the base ; anthers small. *Ovary* 2-4-chambered, with 2-6 ovules in each chamber ; style filiform ; stigma simple. *Fruit* fleshy, more or less 4-angled or terete, 1-locular, crowned with the persistent calyx. *Seed* solitary ; embryo not separable into cotyledons and radicle.

Trees ; leaves alternate, crowded at the ends of the branches, entire or crenate-serrate ; flowers large or small ; inflorescence a raceme or interrupted spike, often elongated, terminal and lateral.

Species about 45, natives of Africa and the Island of Samoa ; 1 species occurs in Natal.

136. RHIZOPHORACEÆ.

Flowers very often bisexual. *Calyx-tube* more or less adnate to the ovary, rarely free ; limb produced above the ovary or cut into 3-14 lobes down to the ovary ; lobes usually valvate. *Petals* free, as many as the calyx-lobes, very often shorter than them, sessile or clawed, sometimes enveloping the stamens, emarginate, 2-fid, or much cut at the apex. *Stamens* 2-4 times as many as the petals, very rarely of the same number, perigynous or epigynous ; filaments very short or elongated ; anthers basi- or dorsi-fixed, 2-theous, very rarely many-theous, opening by longitudinal slits. *Ovary* variously adnate to the calyx-tube, very often inferior, rarely wholly superior, 2-6-chambered, rarely 1-chambered by the disappearance of the septa, with usually 2, rarely 4 or more, ovules in each chamber ; style simple ; stigma simple or lobed. *Fruit* often very leathery, crowned with the persistent calyx, indehiscent, rarely tardily dehiscent, 1-locular, 1-seeded, or 2-5-locular with each loculus 1-seeded. *Seeds* pendulous ; embryo in some genera germinating in the fruit before it falls ; endosperm 0 or fleshy.

Trees or shrubs, often on maritime shores ; leaves opposite, rarely alternate, simple, usually entire, sometimes crenate or serrulate ; stipules present or absent ; inflorescence axillary, a cyme, panicle, spike, or raceme, rarely flowers densely crowded or solitary ; bracteoles present or absent.

Genera 17; species over 50, natives of Africa, the Malay Archipelago, Asia, Australia, Madagascar, America, India, and Ceylon.

Tribe **Rhizophoreæ**: Ovary inferior; style 1; embryo not surrounded by endosperm, germinating in the fruit; leaves opposite, stipulate (genera 1-2).

Tribe **Legnoidææ**: Ovary inferior to superior; style 1; embryo surrounded by a fleshy endosperm; leaves opposite, stipulate (genus 3).

1. Each petal enwrapping 2 stamens; petals not lacerated 2
 Petals not enwrapping the stamens; petals lacerated 3. *Cassipourea*, *Aubl.*
2. Flowers in few-flowered axillary racemes; calyx 4- (rarely 5-) parted; lobes oblong 1. *Rhizophora*, *Linn.*
 Flowers axillary, solitary or clustered; calyx many-parted; lobes linear-lanceolate 2. *Bruguiera*, *Lam.*

5523

1. RHIZOPHORA, Linn.

Calyx surrounded by bracts connate at the base into a cup; tube short, adnate at the base to the ovary; limb 4-5-partite, oblong, persistent, valvate. *Petals* 4-5, inserted at the base of a fleshy disc, sometimes woolly on the margins, concave, enwrapping the stamens, with stalked glands at the apex. *Stamens* 8-12; filaments short; anthers elongated, acuminate. *Ovary* semi-inferior, 2-chambered, with 2 pendulous ovules in each chamber; style subulate; stigma 2-toothed. *Fruit* leathery, ovoid or obconic, surrounded near the base with the persistent calyx, 1-locular, 1-seeded. *Seed* pendulous; embryo germinating before the seed falls; endosperm 0.

Trees; leaves opposite, simple, petioled, ovate or elliptic, entire; stipules caducous; inflorescence a few-flowered axillary raceme.

Species 3, found on the sea-shores of most tropical countries; 1 species in South Africa, found on the coast from the Transkei northwards into tropical Africa.

5526

2. BRUGUIERA, Lam.

Calyx without bracts at the base; tube turbinate, adhering to the ovary; limb 5-14-parted; lobes subulate-lanceolate, valvate. *Petals* as many as the calyx-segments, oblong, bifid, with each lobe produced into 2 long threads at the apex, and the midrib also produced into a thread, concave, woolly or long pilose on the margins, each embracing 2 stamens. *Stamens* twice as many as the petals, in pairs opposite the petals; filaments unequal, half as long as the petals; anthers linear-oblong. *Ovary* inferior, 2-4-chambered, with 2 axillary ovules in each chamber; style nearly as long as the stamens; stigma minutely 2-4-toothed. *Fruit* turbinate, crowned with the persistent calyx, 1-locular, 1-seeded. *Seed* pendulous; embryo germinating before the seed falls.

Trees or shrubs; leaves opposite, simple, petioled, oblong, entire; stipules caducous; flowers axillary, solitary or clustered.

Species 4 or 5, found on the sea coasts of tropical Asia, Australia, and Africa; 1 species in South Africa, found on the coast from the Transkei northwards.

5529

3. CASSIPOUREA, Aubl.

(*Dactylopetalum*, Benth., and *Weihea*, Spreng.)

Calyx valvate, deeply or shortly 4-7-lobed, campanulate or spreading, pilose or glabrous. *Petals* inflexed in bud, lacinated or fimbriated, narrow in outline or broadly spatulate, glabrous or pilose. *Stamens* 8-40, all on

or outside the disc, or some inside and others outside a thick or membranous toothed disc, equalling the calyx or up to 3 times as long. *Ovary* 2-4- chambered (rarely with the chambers confluent at the apex), free or slightly adnate with the base of the calyx, with 2 pendulous ovules in each chamber; style filiform or thickened, obscurely lobed at the apex. *Fruit* fleshy, with septicidal dehiscence. *Seeds* 2-4, compressed or angled, arilliate; endosperm fleshy; embryo straight.

Trees or shrubs; leaves decussate or rarely whorled, leathery or membranous, simple; stipules caducous; flowers solitary or several together, axillary, fasciated, sometimes glomerulate at the thickened nodes, bracteate, with articulated pedicels.

Species 62, natives of Africa, central America, and India, mostly massed in Africa; 3 species in South Africa, extending from Komgha through the Transkei into Natal and the Transvaal; one of these species extends into tropical Africa.

137. COMBRETACEÆ.

Plants sometimes dioecious, or with occasional bisexual flowers. *Flowers* sometimes all bisexual. *Calyx-tube* adnate to the ovary, often produced and constricted above the ovary; limb 4-5- (rarely 6-8-) fid; lobes valvate. *Petals* 4-5, free, sometimes wanting, imbricate or valvate. *Stamens* usually as many as or twice as many as the sepals, very rarely indefinite; filaments subulate or filiform; anthers versatile, didymous, small. *Disc* epigynous or lobed. *Ovary* inferior, 1-chambered, with 2-6 pendulous ovules; style simple, filiform; stigma simple, acute or obtuse. *Fruit* leathery or drupaceous, angled, furrowed, mostly 4-5-winged, 1-seeded. *Seed* pendulous; embryo terete or furrowed; endosperm 0.

Trees or shrubs, often scandent, unarmed or very rarely spiny; leaves opposite, alternate, or rarely whorled, simple; stipules 0; inflorescence a spike or raceme, rarely a panicle or head.

Genera 17; species over 450, natives of Africa, South America, India, the Philippine Islands, and Australia.

1. Petals 0; style hairy towards the base 4. *Terminalia*, Linn.
Petals present; style glabrous 2
2. Calyx produced into a campanulate or cup-shaped limb above the ovary 3
Calyx produced into a long tube above the ovary 3. *Quisqualis*, Linn.
3. Flowers invariably bisexual; fruit 4-5-winged or angled
1. *Combretum*, Linn.
Flowers bisexual and male; fruit usually 2-winged, rarely 3-4-winged
2. *Pteleopsis*, Engl.

5538

1. COMBRETUM, Linn.

(*Poivre*, Comm.)

The usual Combretum

Plants dioecious, occasionally with bisexual flowers. *Calyx-tube* cylindric or 4-6-angled, constricted above the ovary; limb campanulate, 4-5-fid, deciduous, glabrous, pilose or villous within. *Petals* 4-5, small, free, inserted between the calyx-lobes, very rarely 0. *Stamens* 8-10, in 2 series; filaments filiform, elongated; anthers small, didymous. *Ovary* with 2-6 ovules; style subulate; stigma simple. *Fruit* leathery or somewhat soft, 4-6-angled or 4-6-winged, 1-seeded. *Seed* angled or furrowed.

Trees or shrubs, very often scandent, sometimes spiny; leaves opposite, more rarely in whorls of 3 or 4, very rarely alternate, simple, petioled, entire; inflorescence a simple or paniced spike or raceme; bracts small or large.

Species over 250, found in almost all tropical and sub-tropical countries, principally in tropical Africa: 21 species in South Africa, extending from the Transvaal to Natal, the north-western districts, and S.W. Africa; 1 species extends to the Albany and Uitenhage districts.

5539

2. PTELEOPSIS, Engl.

Flowers bisexual and male. *Male flowers*: *Calyx-tube* broadly cup-shaped, long pilose within; teeth broadly triangular. *Petals* free, obcordate or broadly obovate. *Stamens* inserted at the base of the calyx-tube; filaments filiform, almost 3 times as long as the petals; anthers didymous. *Bisexual flowers*: *Calyx-tube* elongated-fusiform (including the ovary), broadly cup-shaped above and with an annular crenate and long pilose disc round the base. *Fruit* elongated-cylindric, 2 winged, rarely 3-winged, with the wings free above.

Small trees; leaves alternate, petioled, simple; inflorescence an axillary raceme, longer than the petioles, with the male flowers below and the bisexual flowers above.

Species 5, all African; 1 species in South Africa, found at Delagoa Bay and doubtfully recorded from Zululand.

5541

3. QUISQUALIS, Linn.

Calyx-tube ovoid below, produced into a long tube above the ovary; limb 5-partite; lobes small, spreading or recurved. *Petals* 5, large or small, obtuse. *Stamens* 10, short, exserted; filaments subulate; anthers ovate. *Ovary* with 3-4 ovules; style filiform, partly adnate to the calyx-tube; stigma sub-dilated, obtuse. *Fruit* dry, oblong, leathery, acutely 5-angled, 5-winged and 5-furrowed, 1-seeded. *Seed* 5-angled, 5-furrowed; cotyledons fleshy.

Scandent shrubs; leaves opposite or sub-opposite, simple, oblong or obovate, acuminate, entire; flowers showy; inflorescence usually a short axillary and terminal spike, sometimes a raceme.

Species 4, natives of Africa, India, and the Philippine Islands; 1 species found in Natal.

5544

4. TERMINALIA, Linn.

Plants dicecious, with occasional bisexual flowers. *Flowers* sometimes all bisexual. *Calyx-tube* ovoid or cylindric, constricted above the ovary; limb urceolate or campanulate, 5-toothed or 5-fid, very often deciduous. *Petals* 0. *Stamens* 10, in 2 rows; the lower row opposite the calyx-teeth; the upper row alternating with the calyx-teeth; filaments subulate or filiform, exserted; anthers small, didymous. *Ovary* with 2, rarely 3, ovules; style subulate, often thickened and villous at the base; stigma simple. *Fruit* ovoid, angled, or compressed, or 2-5-winged, 1-seeded. *Seed* often elongated-ovoid; cotyledons convolute.

Trees or shrubs; leaves alternate, or rarely opposite or sub-opposite, very often crowded at the apices of the branches, usually petioled and entire, sometimes pellucid-dotted and glandular on either side at the base; inflorescence a long lax spike, very rarely a head.

Species about 200, found in almost all tropical countries; 4 species in South Africa, found in the Transvaal, Natal, Bechuanaland, and S.W. Africa.

138. MYRTACEÆ.

Flowers usually bisexual, regular. *Calyx-tube* more or less adnate to the ovary at the base; limb 4-5-parted, or sometimes truncate and almost entire. *Petals* 4-5, free, sometimes connate and all deciduous together, imbricate. *Disc* lining the calyx-tube. *Stamens* usually numerous, in many series, rarely few; filaments free or connate at the base; anthers 2-theous. *Ovary* inferior, more rarely half-inferior, 1 to many-chambered, with usually many ovules in each chamber; style simple; stigma entire, rarely 3-4-parted. *Fruit* a capsule or berry, wholly or partly enclosed in the persistent calyx. *Seeds* without endosperm.

Trees or shrubs, rarely undershrubs; leaves opposite or alternate, simple, entire, gland-dotted; stipules 0; flowers solitary, or inflorescence a cyme, head, umbel, or corymb; bracts and bracteoles often present.

Genera about 72; species over 2,000, mostly natives of Australia, America, and Asia; a few found in Africa.

- | | |
|--|---------------------------------------|
| 1. Ovary 3-4-chambered | 2 |
| Ovary 2-chambered | 3 |
| 2. Leaves opposite, or almost so; inflorescence a dense di- or tri-
chotomous cyme: calyx 5-lobed | 3. <i>Metrosideros</i> , <i>Banks</i> |
| Leaves, at least on old branches, alternate; inflorescence a head or
umbel: calyx truncate or 4-lobed | 4. <i>Eucalyptus</i> , <i>L'Her.</i> |
| 3. Calyx-tube contrasting sharply with the pedicel; ovary in the centre
of the receptacle | 1. <i>Eugenia</i> , <i>Linn.</i> |
| Calyx-tube gradually narrowed into the pedicel; ovary in the upper
part of the receptacle | 2. <i>Syzygium</i> , <i>Gaertn.</i> |

5578

1. EUGENIA, Linn. See 2 ed.

Calyx-tube nearly globose, contrasting distinctly with the pedicel, not or slightly prolonged above the ovary; limb divided down to the ovary; lobes 4, rarely 5. *Petals* 4, very rarely 5, free. *Stamens* numerous, in many series; filaments free; anthers versatile. *Ovary* in the centre of the receptacle, 2-chambered, with many ovules in each chamber; style filiform; stigma small. *Fruit* a berry, nearly globose, crowned by the persistent calyx, usually 1-locular, rarely 2-locular. *Seeds* 1-2, large; cotyledons very thick.

Trees or shrubs, very rarely undershrubs; leaves opposite, simple, entire, gland-dotted; flowers axillary or terminal, solitary, or inflorescence a cymose raceme; bracts and bracteoles often small and very caducous.

Species about 700, found in all tropical and sub-tropical countries, especially America; 11 species in South Africa, extending from the Transvaal and Natal, through the eastern districts, to the Uitenhage district.

5583

2. SYZYGIUM, Gaertn.

Calyx-tube obovate or club-shaped, gradually narrowed into the pedicel, more or less produced above the ovary; limb truncate, sinuate or shortly lobed. *Petals* 4-5, more or less connate and falling off entire. *Stamens* numerous, in many series; filaments free; anthers versatile. *Ovary* in the upper part of the receptacle, 2-chambered, with few ovules in each chamber; style filiform; stigma small. *Fruit* a 1-locular berry, 1- or few-seeded. *Seeds* globose; cotyledons large and fleshy.

Trees or shrubs ; leaves opposite, simple, entire ; inflorescence an axillary and terminal cyme or corymb.

Species about 150, found in most tropical countries ; 2 species in South Africa, found in the Transvaal and Natal.

5558

3. METROSIDEROS, Banks

Calyx-tube campanulate, funnel-shaped, or urceolate, more or less adnate at the base to the ovary ; lobes 5, imbricate. *Petals* 5, spreading. *Stamens* 20-30 or indefinite, in 1 to many series, much longer than the petals ; filaments free ; anthers versatile. *Ovary* inferior or semi-superior, 3-chambered, with many ovules in each chamber ; style filiform ; stigma small or truncate. *Fruit* a capsule, included in or shortly exserted from the persistent calyx-tube, 2-3-locular, with many seeds in each loculus. *Seeds* variously shaped, wingless ; embryo straight.

Trees or shrubs, rarely scandent ; leaves opposite, or rarely almost alternate ; flowers often showy ; inflorescence a terminal, rarely axillary, dense di- or trichotomous cyme.

Species about 31, natives of Australia, Polynesia, and the Malay Archipelago ; 1 species in South Africa, found in the south-western districts to Riversdale.

5598

4. EUCALYPTUS, L'Her.

Calyx-tube turbinate or campanulate, adnate at the base to the ovary, truncate, entire, or remotely 4-toothed at the apex. *Petals* usually connate and falling off together. *Stamens* numerous, in many series ; filaments filiform ; anthers versatile. *Ovary* inferior, 3-4-chambered, with many ovules in each chamber ; style filiform ; stigma simple. *Fruit* a capsule, enclosed in and adnate to the hardened calyx. *Seeds* often angled or linear-cuneate ; embryo straight.

Tall trees ; leaves on young branches often opposite, on older branches mostly alternate, simple, leathery, entire ; inflorescence axillary, usually a head or umbel, rarely flowers solitary ; bracts membranous, very deciduous.

Species over 150, natives of Australia and the Malay Archipelago ; many species cultivated in South Africa.

139. MELASTOMATACEÆ.

Flowers regular, bisexual. *Calyx-tube* often adnate to the ovary ; limb truncate, lobed, or saucer-shaped. *Petals* free, as many as the calyx-lobes, inserted in the mouth of the calyx-limb, imbricate. *Stamens* as many as, or more usually twice as many as, the petals and inserted with them ; filaments various, glabrous or glandular ; anthers basifixed, often horned or spurred, with the connective often thickened at the apex, usually opening by pores. *Ovary* inferior or half-inferior, 2 to many-chambered, rarely 1-chambered, with many, rarely few, ovules in each chamber ; style simple ; stigma simple or lobed. *Fruit* usually enclosed in the calyx-tube, a capsule or berry. *Seeds* mostly minute, rarely large ; endosperm 0.

Herbs, shrubs, or trees, erect, rarely scandent or prostrate or creeping ; leaves opposite, very rarely whorled, simple, often petioled, 3-9-nerved, rarely penninerved, entire, crenate, or serrulate ; stipules 0 ; inflorescence a spike, panicle, or corymb, more rarely flowers solitary or fascicled.

Genera 164; species almost 3,000, found in almost all tropical countries, especially abundant in South America.

Ovary 4-5-chambered 1. *Dissotis*, Benth.
Ovary 1-chambered 2. *Memecylon*, Linn.

5659

1. DISSOTIS, Benth.

(Under *Osbeckia*, Linn in the "Flora Capensis.")

Calyx-tube ovoid, sometimes produced beyond the ovary, glabrous or covered with stellate bristles or scales; lobes 4-5, oblong or lanceolate, often alternating with bristly teeth, persistent or deciduous. *Petals* 4-5, obovate. *Stamens* 8-10, very unequal; anthers linear-subulate; those of the long stamens with an elongated arcuate connective, with an appendage or spur in front; those of the smaller stamens with a short connective. *Ovary* inferior, 4-5-chambered, adhering by 5 septa to the calyx-tube, bristly on top; style curved; stigma simple. *Fruit* a capsule, included in the persistent calyx-tube, convex and bristly on top, 4-5-locular. *Seeds* minute, cochleate.

Herbs or shrubs, usually pubescent; leaves opposite, simple, shortly petioled, entire, 3-5-nerved; flowers solitary, or in panicles at the apex of the branches; bracts sometimes present.

Species 84, all African; 5 species found in South Africa, extending from the Transvaal and Natal to Pondoland.

5788

2. MEMECYLON, Linn.

Calyx-tube broadly campanulate, hemispherical, or saucer-shaped, glabrous; limb dilated, cup-shaped, truncate, entire or shortly 4-lobed at the mouth. *Petals* 4, broadly ovate or orbicular. *Stamens* 8, equal; filaments filiform; anthers hatchet-shaped, with the connective often dilated above, obtusely spurred or horned. *Ovary* inferior, 1-chambered, with 6-12 ovules; style filiform; stigma pointed. *Fruit* a globose berry, 1-seeded. *Seed* large.

Glabrous trees or shrubs; leaves opposite, simple, sessile or shortly petioled, ovate or oblong, entire, penninerved or 3-nerved; flowers usually small; inflorescence an axillary cyme, more rarely a panicle or umbel, or flowers in axillary clusters.

Species about 218, natives of Asia, Africa, Australia, and the Pacific Islands; 2 species in Natal, both of which extend into Pondoland.

140. ONAGRACEÆ.

Flowers usually bisexual, regular or rarely irregular. *Calyx-tube* sometimes produced above the ovary into a long limb, or not produced; lobes 2-4, rarely 5-6, valvate. *Petals* usually 2-4, fugacious, rarely 0. *Stamens* 1-8, very rarely 5, 6, or 12, in 1-2 rows; filaments usually filiform; anthers oblong or linear, rarely didymous or globose. *Ovary* inferior, 2-6- (usually 4-), chambered, or rarely 1-chambered, with 1 to many ovules in 1 to many rows in each chamber; style filiform; stigma capitate, entire, or divided into 4 lobes or stigmatic arms. *Fruit* a capsule, nut, or berry, variously shaped. *Seeds* terete or prismatic-angled, smooth or papillose; embryo very often obovoid; endosperm 0 or very thin.

Annual, biennial, or perennial herbs, rarely shrubs, very rarely trees ; leaves opposite or alternate, simple, entire, pinnatifid, toothed, or serrated ; stipules mostly 0 ; flowers very often axillary and solitary, or inflorescence a terminal spike or raceme.

Genera 38 ; species almost 500, mostly American.

- | | |
|--|-----------------------------|
| 1. Calyx not produced above the ovary into a tube | 2 |
| Calyx produced above the ovary into a distinct tube | 3 |
| 2. Stamens twice as many as the petals | 1. <i>Jussieua</i> , Linn. |
| Stamens as many as the petals | 2. <i>Ludwigia</i> , Linn. |
| 3. Seeds with an apical tuft of hairs | 3. <i>Epilobium</i> , Linn. |
| Seeds without an apical tuft of hairs | 4 |
| 4. Calyx-tube funnel-shaped, as long as, or shorter than the lobes | |
| Calyx-tube cylindric, longer than the lobes | 5 |
| 5. Seeds prismatic-angled | 4. <i>Onagra</i> , Tournef. |
| Seeds egg-shaped, with an apical appendage | 5. <i>Oenothera</i> , Linn. |

5791

1. JUSSIEUA, Linn.

Calyx-tube not produced beyond the ovary ; lobes 4-6, acute, persistent. *Petals* 4-6, spreading. *Stamens* 8-12, in 2 rows ; filaments somewhat short ; anthers ovate or oblong. *Ovary* elongated, cylindric or prismatic, with 4-6 chambers and many ovules in many rows in each chamber ; style simple ; stigma 4-6-lobed. *Fruit* a capsule, linear, oblong, or club-shaped, the body often narrowed into a pedicel-like base, 4-12-angled or -ribbed, opening by valves or by the breaking down of the capsule wall.

Perennial herbs or shrubby plants, with erect or creeping stems ; leaves alternate, simple, membranous and entire, more rarely leathery and serrated ; flowers yellow or white, axillary, solitary, on long or short pedicels ; bracteoles often present.

Species about 50, found in almost all tropical countries, especially abundant in Brazil ; 4 species occur in the Transvaal and Natal.

5793

2. LUDWIGIA, Linn.

Calyx-tube not produced beyond the ovary ; lobes 3-5, acute, generally persistent. *Petals* 3-5, usually 4, rarely 0, lanceolate or obovate, spreading. *Stamens* 3-5, usually 4 ; filaments short ; anthers ovoid or oblong. *Ovary* cylindric, prismatic, or turbinate, 4-5-chambered, with many ovules in many rows in each chamber ; style simple ; stigma capitate and 3-5-lobed or -furrowed. *Fruit* a capsule, terete, 4-5-ribbed, -angled- or -winged, opening by valves or by a terminal pore.

Annual or perennial herbs ; leaves opposite or alternate, simple, very often lanceolate, entire, membranous ; flowers axillary or terminal, solitary, usually sessile, sometimes inflorescence a terminal head ; bracteoles present.

Species about 24, natives of North America ; rare in tropical Africa ; 2 species in South Africa, found in the Transvaal, Natal, and extend to Komgha ; also recorded from S.W. Africa.

5795

3. EPILOBIUM, Linn.

Calyx-tube prolonged above the ovary ; limb 4-partite, deciduous. *Petals* 4, obovate or obcordate, often notched, erect or spreading. *Stamens* 8 ; anthers linear or oblong. *Ovary* linear, 4-angled or terete, 4-chambered, with many ovules in 2 rows in each chamber ; style filiform ; stigma club-shaped or 4-lobed. *Fruit* a capsule, narrow, elongated, 4-sided, opening by 4 valves. *Seeds* terminating in a tuft of hairs.

Caululent herbs or sometimes shrubby plants, decumbent, creeping, or erect; leaves alternate or opposite, simple, entire or toothed; flowers axillary, solitary, or inflorescence a spike or raceme.

Species about 200, found in most parts of the world except the tropics; 5 species recorded from South Africa, extending from the Cape to Natal and the Transvaal.

5803

4. ONAGRA, Tourn.

Calyx-tube produced above the ovary into a long cylindric tube; lobes reflexed. *Petals* 4, obovate. *Stamens* equal; filaments elongated; anthers linear, versatile. *Ovary* 4-chambered, with numerous ovules in 2 or more rows in each chamber; style long, divided above into 4 linear stigmatic branches. *Fruit* a 4-angled capsule, more or less tapering above, with loculicidal dehiscence. *Seeds* prismatic-angled.

Annual or biennial herbs, usually erect; leaves alternate, undulate or toothed; buds erect; flowers yellow; inflorescence a terminal spike.

Species 8, natives of North America; 1 species naturalised in South Africa.

5804

5. OENOTHERA, Linn.

Characters of *Onagra* but ovules in 2 rows; capsule usually narrowly cylindric, sometimes slightly tapering; seeds terete, egg-shaped, with an appendage on top.

Caululent herbs, annual, biennial, or perennial, erect or depressed; flowers yellow, axillary, or inflorescence sometimes a terminal spike.

Species about 20, natives of South America; 1 or 2 species naturalised in South Africa.

5807

6. XYLOPLEURUM, Spach.

Characters of *Onagra* but calyx-lobes not so strongly reflexed; calyx-tube funnel-shaped and as long as or shorter than the lobes; stamens slightly unequal; ovules in many rows, with elongated funicles; fruit stalked and club-shaped, or sessile and pyramidal, rarely prismatic, usually keeled at the angles.

Leaves usually pinnatifid; flowers white or red.

Species 10, natives of North America; 1 or 2 species naturalised in South Africa.

141. HALORRHAGIDACEÆ.

Flowers bisexual or unisexual, often minute and incomplete. *Calyx-lobes* 2-4, or 0, rarely 3. *Petals* 2-4 or 0, free, concave, deciduous, valvate, or the margins imbricate. *Stamens* 2-8, rarely 1 or 3; filaments short, filiform, rarely elongated; anthers basifixed, very often linear-oblong. *Ovary* inferior, compressed, or 2-8-angled, or -ribbed, rarely 2-4-winged, 1-4- (rarely 3-) chambered, with 1 to few pendulous ovules in each chamber; styles 1-4, usually free, plumose or papillose. *Fruit* usually minute, nut-like or drupaceous, compressed, angled, ribbed, or winged, indehiscent, 1-3-locular, or of 2-4 cocci, with a single seed in each loculus or coecus. *Seeds* pendulous; embryo cylindric; endosperm fleshy, often copious.

Perennial herbs or undershrubs, rarely annuals, often aquatics or found growing in water or wet places; leaves opposite, alternate, or whorled, simple or pectinato-pinnatifid: stipules 0, rarely present and adhering to the petiole: flowers very often axillary, solitary or clustered, more rarely inflorescence a raceme, spike, panicle, or corymb.

Genera 8; species about 100, found almost throughout the world.

1. Aquatic plants, with pectinato-pinnate leaves in whorls of 3 or 4;
leaf-segments filiform 2. *Myriophyllum*, Linn.
Terrestrial plants, but often found growing in water or damp places;
leaves alternate or opposite, not pinnately divided 2
2. Leaves small, sessile; flowers in axillary fascicles 1. *Laurembergia*, Berg.
Leaves large, on long petioles; inflorescence a terminal spike
3. *Gunnera*, Linn.

5833

1. LAUREMBERGIA, Berg.

(Serpicula, Linn.)

Flowers unisexual. *Male flowers*: *Calyx-tube* very short; lobes 4, ovate, acute. *Petals* 4, concave. *Stamens* 4 or 8; filaments short; anthers linear, basi-fixed. *Ovary* 0; stigmas 4, rudimentary. *Female flowers*: *Calyx-tube* ovoid, 8-ribbed; lobes 4, ovate, acute, deciduous. *Petals* as in the male. *Stamens* 0. *Ovary* 1-chambered, with 4 pendulous ovules; styles 4, feathery. *Fruit* a fleshy nut, with a single seed, 8-ribbed. *Seed* cylindric; embryo terete; endosperm fleshy.

Small herbaceous creeping plants; leaves opposite or alternate, linear or lanceolate, entire or toothed; flowers minute, in axillary fascicles; the male flowers long-pedicelled; the female flowers sessile or shortly pedicelled.

Species about 19, natives of India, Madagascar, Africa, and Brazil; 1 species occurs in South Africa and widely spread in the coastal districts, but also occurs in the northern Transvaal.

5834

2. MYRIOPHYLLUM, Linn.

Flowers unisexual, rarely bisexual. *Male flowers*: *Calyx-tube* very short; limb 4- (rarely 2-) lobed, sometimes absent. *Petals* 2-4, concave, sessile. *Ovary* 0. *Stamens* 2-8; filaments filiform; anthers linear-oblong, basifixed. *Female flowers*: *Calyx-tube* 4-furrowed; lobes 0, or 4 and minute. *Petals* minute or 0. *Stamens* 0 or rudimentary. *Ovary* 4- (rarely 2-) chambered, with a solitary pendulous ovule in each chamber; styles 4, short, very often recurved and plumose. *Fruit* a nut or drupe, 4-lobed, of 4 indehiscent carpels, each carpel 1-seeded. *Seed* pendulous; endosperm copious.

Aquatic herbs; leaves opposite, alternate, or whorled (whorled in the S. African species), linear or ovate, entire, toothed, or pectinato-pinnate (in the S. African species); flowers axillary, solitary, sessile or shortly stalked, or (in the S. African species) inflorescence a terminal spike; upper flowers male, lower female, with the intermediate sometimes bisexual.

Species about 27, found almost all over the world; 1 species in South Africa, extending from the Transvaal and Natal to Uitenhage, then again recorded between Robertson and Montagu.

5836

3. GUNNERA, Linn.

Flowers unisexual or bisexual. *Calyx-tube* ovoid or compressed; lobes 2-3, often imperfect or 0 in the male flower. *Petals* 2, concave, or 0. *Stamens* 1-2; filaments filiform; anthers oblong, basifixed. *Ovary* 1-chambered,

with a solitary pendulous ovule ; styles 2, papillose. *Fruit* a leathery or fleshy drupe, compressed, 3-angled or almost globose. *Embryo* pear-shaped or obcordate ; endosperm copious.

Nearly stemless herbaceous plants growing in water or wet places ; leaves radical, alternate, simple, petioled, ovate, or rounded and cordate at the base, entire, lobed, or crenate ; stipules present, adhering to the petiole ; flowers minute ; inflorescence a head or compound spike, on simple or branched scapes.

Species about 27 ; natives of Africa, Java, Tasmania, New Zealand, and South America ; 1 species found in South Africa, widely spread in the coastal districts ; also found in the Queenstown district, Basutoland, Natal, Swaziland and the Transvaal.

142. ARALIACEÆ.

Plants rarely dicecious. *Flowers* regular, bisexual, more rarely unisexual, or unisexual with occasional bisexual flowers. *Calyx-limb* annular or broadly and shortly cupular. *Petals* 3 to many, often 5, valvate or slightly imbricate. *Stamens* as many as the petals, rarely more ; filaments filiform or thickened ; anthers ovate or oblong. *Disc* epigynous, various. *Ovary* inferior, 1 to many chambered, with a solitary pendulous ovule in each chamber ; styles as many as the ovary chambers, distinct or connate at the base. *Fruit* a berry or drupe, with as many loculi as chambers in the ovary. *Seeds* pendulous ; embryo next to the hilum, with ovate or oblong cotyledons ; endosperm copious.

Trees or shrubs, rarely herbs, sometimes scandent ; leaves alternate, very rarely opposite, entire, toothed, palmatifid, pinnatifid, or digitately compound ; stipules adnate to the petiole ; inflorescence a head, umbel, spike, or raceme, with the racemes panicle or umbellate, rarely flowers solitary ; bracts and bracteoles usually present.

Genera 54 ; species about 625, natives of India, the Pacific Islands, Japan, America, Asia, Australia, Madagascar, and Africa.

5872

1. CUSSONIA, Thunb.

Calyx with an undulated 5-toothed margin, or sub-entire. *Petals* 5, valvate. *Stamens* 5 ; anthers ovate. *Disc* flat, or depressed, or conical in the middle. *Ovary* 2-chambered ; styles 2, very short and thick, or elongated, scarcely connate, oblique or stigmatose on the inside. *Fruit* fleshy, laterally compressed or sub-globose. *Seeds* globose, ovoid, or laterally compressed ; endosperm ruminant.

Shrubs or trees, sometimes armed ; leaves alternate, on long petioles, often crowded at the apices of the branches, palmatifid or digitate, rarely twice digitate ; leaflets entire, deeply toothed, or pinnatifid ; stipules adnate to the petiole ; inflorescence a dense spike, raceme, or umbel, with the spikes or umbels often panicle ; bracts scale-like or none.

Species about 26, natives of Africa, Madagascar, and the Mascarene Islands ; 8 species occur in South Africa, extending from the Transvaal and Natal, through the coastal districts to the Cape.

Note.—A plant collected in Natal and named *Panax Gerrardi*, Harv. has passed through my hands. It differs from the description of the genus in (1) having simple leaves, (2) the pedicel not being articulated and (3) the filaments being short and thick (not filiform). It is the same plant figured in Hooker's "Icones Plantarum" pl. 1454 as *Cussonia Gerrardi*, Seem. As only a single specimen was examined which was not in fruit I have not included it in the generic descriptions. It may be a species of *Panax* or it may turn out to be an undescribed genus.—E.P.P. 331.

143. UMBELLIFERÆ.

Flowers usually regular and perfect. *Calyx* truncate and entire, or with small teeth. *Petals* 5, free, inserted on the outside of a fleshy epigynous disc, usually with inflexed points which are joined to the middle vein of the lamina. *Disc* flattened and expanded, depressed, or conical, with entire erenate or undulate margins. *Stamens* 5, alternating with the petals; filaments inflexed, at least in the bud; anthers 2-theccous. *Ovary* inferior, 2-chambered, very rarely 1-chambered by abortion, with a solitary pendulous ovule in each chamber; styles 2, free. *Fruit* often crowned with the persistent calyx-teeth and styles, consisting of 2 easily separable mericarps which cohere by their inner face to a common axis, but at maturity separate from the axis and for a time are pendulous from its summit. *Mericarps* indehiscent, marked with 5 longitudinal primary and often with 4 secondary intermediate ribs; ribs separated by furrows; longitudinal oil-tubes usually under the furrows, sometimes under the ribs, or wanting. *Seed* flat, concave, or furrowed on the inner face; embryo minute; endosperm copious, horny.

Herbs, rarely shrubs or trees; leaves alternate, very rarely opposite, often radical, usually with sheathing petioles, and with pinnately or ternately divided blades often cut into capillary segments, rarely leaves entire; inflorescence a simple or compound umbel, rarely a head or small cyme; involucre and involucrels present or absent.

Genera 257, with over 2,250 species, found in the temperate regions, especially numerous in Europe and Asia, numerous in America, Africa, and Australia.

Sub-family Hydrocotyloideæ: Fruit with a woody endocarp, without free carpophores; oil-ducts absent or sunk in the primary ribs, not in the hollows.

Tribe *Hydrocotyleæ*: Fruit with a narrow commissure and prominent ribs, breaking up into 2 compressed mericarps (genera 1-2).

Tribe *Mulineæ*: Mericarps with a flattened or rounded back, wider near the commissure (genus 3).

Sub-family Saniculoideæ: Fruit with a soft endocarp; exocarp covered with scales, thorns, or bristles, rarely smooth; styles surrounded by a ring-like disc; oil-ducts in the primary ribs, or more or less absent.

Tribe *Saniculeæ*: Fruit with flat commissures; oil-ducts mostly present (genera 4-6).

Sub-family Apioidæ: Fruit with a soft endocarp, sometimes with a hardened exocarp; styles on top of the stylopodium; oil-ducts in young fruits originating in the grooves.

Tribe *Sandicineæ*: The primary ribs weakly or strongly developed as ridges; fruit cylindric and beaked, smooth or very shortly thorny; seed grooved or hollow on the face (genera 7-9).

Tribe *Smyrnieæ*: The primary ribs weakly or strongly developed as ridges; mericarps convex on the back, with narrow commissures; primary ribs weakly or strongly developed (genus 10).

Tribe *Ammineæ*: The primary ribs weakly or strongly developed as ridges; side-nerves and the 3 dorsal nerves similar; seed semi-terete in cross-section (genera 11-30).

Tribe *Peucedaneæ*: The primary ribs weakly or strongly developed as ridges; side-nerves very much broader than the 3 dorsal nerves and form wings on the margins of the mericarps; seed narrow in cross-section (genera 31-34).

Tribe *Dauceæ*: Secondary ribs over the oil-ducts developing ridges and wings equal to those of the primary ribs, or even larger (genus 35).

1. Lower leaves different from the upper leaves 2
- Leaves all alike, or the cauline or all the leaves reduced to bracts 3
2. Inflorescence a compound umbel 22. *Pimpinella*, *Lin.*
- Inflorescence a simple umbel, clustered at the nodes 28. *Anethum*, *Tourn.*

3. Plants with radical leaves which are tomentose or woolly on both surfaces or on the underside only ; peduncles long and nude
3. Hermas, Linn.
 Leaves not tomentose nor woolly, but if tomentose then peduncles not long 4
4. Involucral bracts conspicuous and petaloid . . . **5. Alepidea, De la Roche**
 Involucral bracts small or absent, if large then not petaloid . . . 5
5. Plants with radical leaves lying flat on the ground and spiny on the upper surface . . . **6. Arctopus, Linn.**
 Plants with radical or cauline leaves or both, but radical leaves not lying flat nor spiny . . . 6
6. Petioles persistent, with the blade wanting or nearly so in the adult plant . . . **18. Pituranthos, Viv.**
 Petioles when present not persistent . . . 7
7. Leaves simple . . . 8
 Leaves compound or much divided, sometimes reduced to scales . . . 11
8. Leaves with long petioles and a distinct blade, rarely not differentiated into petiole and blade, but then umbels simple . . . 9
 Leaves grass-like, not differentiated into a petiole and blade ; umbels compound . . . 10
9. Leaves rounded at the base, sometimes peltate ; stipules present
1. Hydrocotyle, Linn.
 Leaves usually cuneate and narrowed at the base ; stipules absent
- 2. Centella, Linn.**
 10. Carpophore indistinct or absent . . . **26. Oenanthe, Linn.**
 Carpophore 2-fid or 2-partite . . . **14. Bupleurum, Tourn.**
11. Fruits hairy, bristly, prickly, or tubercled . . . 12
 Fruits not as above, but often ribbed . . . 20
12. Spines hook-pointed ; leaves digitately divided . . . **4. Sanicula, Linn.**
 Spines when present not hook-pointed, if slightly so then the leaves pinnately divided . . . 13
13. Fruit villous . . . 14
 Fruit bristly, prickly, or tubercled . . . 15
14. Erect plants ; cauline leaves reduced to bracts ; hairs not club-shaped . . . **18. Pituranthos, Viv.**
 Acaulescent plants ; leaves pinnate ; hairs club-shaped
34. Choritaenia, Benth.
15. Involucels of many long linear acuminate bracts, much longer than the flowers . . . **35. Daucus, Linn.**
 Involucels of few linear bracts, scarcely exceeding the pedicels . . . 16
16. Involucre of compound or pinnatifid bracts . . . **19. Trachyspermum, Linn.**
 Involucre of simple bracts or wanting . . . 17
17. Fruits tubercled . . . 18
 Fruits prickly, or prickly and ciliate, or 1 mericarp tubercled and the other prickly . . . 19
18. Cauline leaves pinnately decompound . . . **31. Capnophyllum, Gaertn.**
 Cauline leaves reduced to bracts . . . **18. Pituranthos, Viv.**
19. Endosperm flat . . . **8. Torilis, Adans.**
 Endosperm rolled in on the edges . . . **9. Caulalis, Linn.**
20. Carpophore absent, undivided, or shortly bifid . . . 21
 Carpophore 2-partite . . . 23
21. Leaves simply pinnate ; pinnae many, sharply serrated ; involucre of many long persistent bracts . . . **23. Sium, Linn.**
 Leaves decompound, if simply pinnate then pinnae 3-4 or filiform but not regularly serrated ; involucre of small bracts or wanting . . . 22
22. Petals obovate or cuneate ; seed with a deep furrow on the inner face
10. Conium, Linn.
 Petals ovate ; seed sub-terete, not furrowed on the inner face
16. Apium, Linn.
23. Mericarps semi-terete . . . 24
 Mericarps flattened . . . 30

24. Sepals conspicuous 25
 Sepals minute or 0 27
25. Fruit crowned with the persistent calyx . . . 11. *Lichtensteinia*, *Ch. & Sch.*
 Fruit not crowned with the persistent calyx 26
26. Fruit ovate or oblong 20. *Ptychotis*, *Koch*
 Fruit almost globose 15. *Rhyticarpus*, *Sond.*
27. Involucre and involucrel present ; sub-fleshy plants of the sea-shore
 29. *Cnidium*, *Cuss.*
 Involucre absent ; involucrel often absent, if present then leaves not
 sub-fleshy 28
28. Ultimate leaf-segments filiform 27. *Foeniculum*, *Linn.*
 Ultimate leaf-segments flattened, sometimes broad 29
29. Fruit sub-globose 22. *Pimpinella*, *Linn.*
 Fruit much longer than broad 7. *Anthriscus*, *Hoffm.*
30. Woody plants 31
 Herbaceous plants, if slightly woody then the fruits almost winged . . . 33
31. Fruit winged 32
 Fruit with prominent ribs, but not winged . . . 25. *Polemannia*, *E. & Z.*
32. Mericarps unequal ; the median rib forming a distinct keel
 13. *Heteromorpha*, *Ch. & Sch.*
 Mericarps equal ; the median rib not forming a distinct keel
 32. *Peucedanum*, *Linn.*
33. Fruit dorsally compressed 34
 Fruit laterally compressed, or semi-terete in cross-section 36
34. Involucre and involucrel wanting 33. *Pastinaca*, *Linn.*
 Involucre and involucrel of few to many bracts 35
35. Mericarps winged on the margin only 32. *Peucedanum*, *Linn.*
 Mericarps with 4 wings or with prominent ribs
 30. *Annesorrhiza*, *Ch. & Sch.*
36. Mericarps with the primary ribs prominent and obtuse or winglike . . . 37
 Mericarps with the primary ribs filiform not or rarely prominent . . . 38
37. Involucre and involucrel of many bracts ; mericarps with the primary
 ribs acute and nearly winglike 12. *Ruthea*, *Bolle.*
 Involucre and involucrel of a few subulate bracts or 0 ; mericarps
 with the primary ribs obtuse 25. *Polemannia*, *E. & Z.*
38. Calyx toothed 24. *Seseli*, *Linn.*
 Calyx-teeth obsolete or nearly so 39
39. Fruit at least twice as long as broad 21. *Carum*, *Linn.*
 Fruit not twice as long as broad 17. *Petroselinum*, *Hoffm.*

5893

1. HYDROCOTYLE, Linn.

Flowers bisexual. *Calyx-teeth* minute, but evident. *Petals* entire, acute, often with incurved tips, valvate. *Disc* flat, or nearly so. *Fruit* lenticular, laterally compressed, orbicular or depressed, smooth. *Mericarps* with 5 primary distinct ribs, without large oil-tubes. *Seed* lenticular.

Perennial herbs of damp places, with creeping stems ; leaves alternate, simple, long-petioled, with entire or lobed palmately-nerved blades ; blades sometimes peltate, deeply cordate or divided to the base into 3, 5, or more segments ; stipules present in the cauline leaves ; inflorescence a simple or branched peduncled umbel, more rarely a small cyme ; bracts of involucre obsolete or wanting.

Species 50-60, found in almost all temperate and tropical countries ; about 7 species occur in South Africa, widely distributed in the coastal belt from the south-western regions to Natal and the Transvaal.

5894

2. CENTELLA, Linn.

Flowers bisexual, with occasional unisexual flowers. *Calyx-teeth* obsolete. *Petals* obtuse, imbricated. *Disc* flat or concave. *Fruit* lenticular, laterally compressed, sub-orbicular, cordate, or reniform, smooth. *Mericarps* with the ribs connected by a network of veins. *Seed* lenticular.

Perennial herbs, with creeping or horizontal rootstocks; leaves alternate, clustered at the nodes, long-petioled, with entire or toothed palmately-nerved blades, rarely leaves linear; blades usually cuneate or narrowed at the base; stipules absent; inflorescence a head-like long-peduncled umbel; bracts of involucre 2-4, small.

Species about 20, natives of Africa, Australia, New Zealand, America; some found in most warm countries; about 10 found species in South Africa, extending from the south-western districts to Pondoland.

5917

3. HERMAS, Linn.

Flowers unisexual. *Calyx-teeth* ovate or lanceolate, leafy, persistent. *Petals* somewhat filiform, inflexed at the apex. *Disc* flattened. *Fruit* ovate, dorsally compressed. *Mericarps* orbicular, flat, or convex on the back and face, with 5 veins and many oil-tubes in the furrows; the dorsal vein exserted; the 2 intermediate veins larger; the 2 lateral veins very small. *Carpophore* undivided.

Large herbaceous or sub-shrubby plants of a tufted habit; leaves radical, petioled, entire, tomentose or woolly on both sides or on the undersurface only; inflorescence a compound crowded umbel, in each umbel 1 female flower surrounded by a number of male flowers; involucre and involucre of many bracts.

Endemic; species 5, extending from Clanwilliam to the Uitenhage district.

5918

4. SANICULA, Linn.

Flowers unisexual or bisexual. *Sepals* conspicuous, free in the bisexual flowers, more or less connate in the unisexual flowers. *Petals* more or less emarginate above, with an inflexed point, imbricate. *Disc* flat. *Styles* filiform, rarely somewhat thickened, scarcely exceeding or longer than the sepals. *Fruit* globose or oblong; main veins usually obtuse, spiny, with the spines often hooked. *Carpophore* 0. *Mericarps* broad or narrow on the inner face, smooth, or rarely setose or granulate, with 5 large oil-tubes beneath the veins, or oil-tubes more or less numerous and arranged round the seed. *Seed* flat or more or less deeply concave or grooved on the face.

Perennial herbs; leaves ternate, palmately-partite or variously pinnate; inflorescence a simple or compound umbel, rarely the umbels arranged in a raceme; bracts conspicuous or small.

Species about 40, found in almost all parts of the world except the Arctic regions, absent from Australia; 1 species occurs in South Africa, extending from the northern Transvaal, through Natal to Komgha; also recorded from near Grahamstown.

5922

5. ALEPIDEA, De la Roche

Flowers bisexual. *Calyx-teeth* somewhat large, membranous, sub-acute sometimes absent. *Petals* erect, more or less obovate, with long inflexed apices. *Disc* depressed, dilated, with a thickened margin. *Styles* as long as or exceeding the sepals and petals; stigma capitate. *Filaments* usually long exserted, filiform. *Fruit* ovoid- or obovoid-globose, scarcely laterally compressed. *Carpophore* reduced, filiform, undivided. *Mericarps* strongly convex on the back, with the primary veins obtuse, with 5 conspicuous oil-tubes, scaly.

Perennial herbs; leaves entire, toothed, with the teeth setose; inflorescence a few-flowered head; involucre bracts conspicuous, often in 2 rows.

An African genus of 23 species; 21 species found in South Africa, extending from Riversdale through the eastern districts to Natal and the Transvaal; also found in Basutoland and the eastern O.F.S.

5926

6. ARCTOPUS, Linn.

Plants diœcious. *Male flowers*: *Sepals* 5, narrowly lanceolate, setoso-acuminate. *Petals* oblong or oblanceolate. *Disc* flattened. *Styles* 0. *Stamens* long exserted. *Female flowers*: *Sepals* 5, rarely 10, smaller than in the male, spinoso-acute, at length rigid. *Petals* scarcely different from the sepals. *Styles* much longer than the sepals. *Fruit* compressed-ovoid, usually beaked. *Carpophore* much reduced. *Mericarps* flat on the inner face, with the primary veins more or less evident and spiny, rarely glabrous, without oil-tubes.

Acaulescent depressed perennial herbs; leaves lying flat on the ground, petioled, lobed, mostly spiny above, with setose margins; male inflorescence a compound stalked umbel, sterile, but mixed with a few female flowers, with an involucre of 5-7 leaves; female inflorescence a sessile umbel, surrounded usually by 4, rarely 5, connate bracts.

Endemic; species 3; extending from the south-western districts to the Albany district.

5938

7. ANTHRISCUS, Hoffm.

Flowers bisexual. *Calyx-teeth* obsolete or minute. *Petals* oblong or cuneate, emarginate or sub-entire. *Disc* small, conical or depressed, often entire. *Fruit* ovate or oblong, shortly attenuated at the apex, laterally compressed or constricted on the inner face. *Mericarps* semi-terete, with the primary veins not conspicuous, with the oil-tubes very thin or inconspicuous, smooth or sparsely muricate. *Carpophore* undivided or 2-fid. *Seed* sub-terete or compressed dorsally, deeply furrowed on the face.

Annual or biennial rarely perennial herbs, hirsute or rarely glabrous; leaves pinnate or sub-ternately cut, with the segments often wide pinnatifid and toothed; inflorescence a compound umbel; involucreal bracts 1-2 or 0.

Species about 13, natives of Europe and eastern Asia; 1 species naturalised in South Africa.

5945

8. TORILIS, Adans.

Flowers bisexual. *Sepals* prominent, acute. *Petals* often unequal, obovate or cuneate. *Disc* conical. *Fruit* flattened laterally, spiny. *Mericarps* with the secondary ribs scarcely prominent, prickly, with the primary ribs ciliate, and with large oil-tubes. *Seed* with the endosperm deeply grooved on the inner face and flat at the edge.

Annual caulescent herbs; leaves pinnately decompose; inflorescence a compound head-like or spreading umbel; umbels of 6-12 rays; involucre of few bracts or wanting; involucre of several or many narrow bracts.

Species about 23, natives of the Canary Islands, the Mediterranean Region, Europe, Asia, and Africa; 1 species naturalised in South Africa.

5950

9. CAUCALIS, Linn.

Characters of *Torilis*, but the primary ribs prickly; secondary ribs with 1-3 rows of prickles, or 1 mericarp tubercled and the other prickly; endosperm rolled in on the edge; umbels of 2-6 rays.

Species 5, natives of Europe, Africa, Asia, and North America; 1 or 2 species found as aliens in South Africa.

5970

10. CONIUM, Linn.

Flowers bisexual, with occasional unisexual flowers. *Calyx-teeth* obsolete. *Petals* obovate or cuneate. *Disc* depressed, sub-entire. *Fruit* broadly ovate,

laterally compressed. *Mericarps* sub-5-angled, with the primary veins prominent, obtuse, undulate-crenate or smooth; lateral veins distinct; oil-tubes many, very thin, irregular. *Carpophore* undivided. *Seed* sub-terete in cross-section, with a deep narrow groove on the inner face.

Erect biennial herbs; leaves pinnately decomposed, with the segments pinnatifid or toothed; inflorescence a compound umbel of many rays; involucre and involucels of many small bracts.

Species 2, natives of Europe, Asia, and Africa; 2 species in South Africa, found in the Transvaal and Natal to the Uitenhage district; also found in Basutoland and the eastern O.F.S.

5990

11. LICHTENSTEINIA, Cham. & Schlecht.

Flowers bisexual. *Calyx-teeth* 5, somewhat acute. *Petals* elliptic, long-acuminate. *Disc* conical, often connate high up, not dilated at the base. *Styles* short. *Fruit* ovoid or oblong, nearly terete, crowned with the persistent calyx. *Mericarps* semi-terete, smooth, with 5 primary veins, with a large oil-tube under each, but none in the furrows or inner face of the mericarps. *Carpophore* 2-partite. *Seed* semi-terete, flattened on the face, often grooved on the back.

Perennial aromatic herbs; leaves radical, acutely toothed, pinnatifid or pinnatisect; inflorescence a compound umbel; involucre and involucels of many small bracts.

Endemic; species 7, extending from the south-western districts to Natal and the Transvaal.

5991

12. RUTHEA, Bolle.

(*Glia*, Sond.)

Flowers bisexual. *Calyx-teeth* 5, triangular, acute, persistent, not enlarged after flowering. *Petals* obovate, sub-emarginate, with an inflexed lanceolate point. *Disc* conical. *Fruit* ovate-oblong, sub-terete, crowned with the persistent disc and spreading styles. *Mericarps* with 5 sharp nearly wing-like primary veins and lateral marginal veins, with a single oil-tube in the furrows and with 2 oil-tubes on the inner face. *Carpophore* bipartite. *Seed* semi-terete, flattened in front.

Perennial glabrous erect herbs; leaves pinnate; inflorescence a compound umbel; involucre and involucel many-leaved.

Species 3, natives of the Canary Islands, St. Helena, and South Africa; one species found in the south-western districts.

5992

13. HETEROMORPHA, Cham. & Schlecht.

Flowers bisexual. *Calyx-teeth* 5, triangular, acute. *Petals* rounded or broadly ovate, entire, truncate and retuse at the apex. *Disc* conical, with an undulate margin. *Fruit* obovate-pearshaped, 3-winged. *Mericarps* of 2 forms, mostly flattened, rarely semi-terete, with a single oil-tube in the furrows and 2 oil-tubes on the inner face; the outer 2-winged; the inner 3-winged. *Carpophore* 2-partite. *Seed* sub-terete.

Shrubs or undershrubs, often trees; leaves petioled, simple, 2-3-sect or -pinnate, solitary or laxly fasciated; inflorescence a compound umbel of many rays; involucre and involucels of many short bracts.

An African genus of 3 species; 1 species found in South Africa, extending from the Transvaal, Natal, Basutoland and the eastern O.F.S. through the coastal districts to Riversdale.

5994

14. BUPLEURUM, Tourn.

Flowers bisexual. *Calyx-teeth* obsolete or very rarely conspicuous. *Petals* sub-orbicular, sub-ovate, or oblong, more or less deeply concave, broad and retuse at the apex. *Disc* flat, depressed, rarely sub-conical. *Fruit* more or less laterally compressed or sub-didymous, crowned with the persistent disc. *Mericarps* with 5 acute wings, or filiform sometimes obsolete veins, with oil-tubes absent or present in the furrows. *Carpophore* 2-fid or 2-partite. *Seed* sub-terete.

Annual or perennial herbs, sometimes undershrubs; leaves more or less crowded at the base of the stem, scattered above; leaves entire and grass-like, attenuate or cordate at the base; inflorescence a compound umbel of many rays; involucre and involucels of variously shaped bracts, or 0.

Species almost 100, natives of Europe, Asia, America, and Africa; 4 species in South Africa, extending from the south-western districts to Natal and the Transvaal.

5996

15. RHYTICARPUS, Sond.

Flowers bisexual. *Calyx-teeth* conspicuous, triangular, acute. *Petals* broadly ovate, with the acute or acuminate apex inflexed. *Disc* conical. *Styles* sometimes filiform, much exceeding the petals. *Fruit* obovoid, laterally compressed, crowned with the persistent disc and styles. *Mericarps* semiterete, with 3-5 prominent veins on the back, flat on the face, with a single oil-tube in each furrow and 2 oil-tubes on the face. *Carpophore* bipartite. *Seed* convex, flattish on the inner face.

Perennial herbs or undershrubs; leaves flat, bi-ternate, or tri-pinnatisect, or the petiole reduced to a phyllode; inflorescence a compound umbel; involucre and involucels of many small bracts.

Endemic; species 3, found in the south-western districts and extending into Kaffraria.

6004

16. APIUM, Linn.

(Helosciadium, Koch)

Flowers bisexual. *Calyx-teeth* 5, or teeth obsolete. *Petals* ovate, often acute, sometimes with an incurved apiculus. *Disc* depressed or shortly conical. *Fruit* sub-orbicular, ovate, or oblong, laterally compressed, often didymous. *Mericarps* 5-angled, with the primary veins prominent and sometimes crenate-undulate, with a single oil-tube in each furrow. *Carpophore* undivided or shortly bifid. *Seed* sub-terete.

Annual or perennial herbs; leaves pinnate, or tripinnately decompound; inflorescence a compound umbel; involucre bracts few, solitary, or 0; involucels of many bracts, or 0.

Species about 20, found in most parts of the world; 3 species in South Africa, found in the Transvaal, Natal, and the coastal districts to Riversdale, but extending into the north-western districts and S.W. Africa.

6006

17. PETROSELINUM, Hoffm.

Flowers bisexual. *Calyx-teeth* obsolete. *Petals* sub-orbicular, entire, scarcely emarginate, with a narrow incurved point. *Disc* conical, sub-crenate. *Fruit* ovate, laterally compressed, sub-didymous. *Mericarps* with 5 filiform equal veins, with a single oil-tube in the furrows and with 2 oil-tubes on the inner face. *Carpophore* bipartite. *Seed* convex, somewhat flat on the inner face.

Herbs; leaves decompound, with cuneate segments; inflorescence a compound umbel; involucre of few bracts; involucels of many bracts.

Species 5, natives of central Europe and the Mediterranean Region; 1 species naturalised in South Africa.

6013

18. PITURANTHOS, Viv.

(Deverra, D C.)

Flowers bisexual. *Calyx-teeth* obsolete. *Petals* ovate, with a long inflexed point. *Disc* conical, dilated at the base, with an undulated margin. *Fruit* ovate, laterally compressed, hirsute or scaly. *Mericarps* sub-terete, 5-angled, with the primary veins filiform and scarcely prominent, with solitary oil-tubes in the furrows. *Carpophore* 2-partite. *Seed* sub-terete.

Rigid perennial herbs, or broom-like undershrubs; leaves radical or at the base of the stem, tri-pinnately decomposed; cauline leaves few or all reduced to scales; petioles permanent, with the limb wanting or nearly so in the adult plants; inflorescence a few-rayed compound umbel; involucre and involucels of few bracts, or bracts 0.

Species about 10, natives of Africa and the Orient; 2 species in South Africa, found in the Transvaal, the O.F.S., and the central districts and extend into S.W. Africa; also recorded from the Uitenhage district.

6014

19. TRACHYSpermum, Link.

Characters of *Ptychotis*, but the fruits muricated or hispidulous.

Annual or biennial herbs; leaves bi- or almost tri-pinnate, with the segments long, setaceous; inflorescence a compound umbel; involucre usually pinnatifid or compound; involucel of few bracts, shorter than the pedicels.

Species about 12, natives of Africa, western Asia, and eastern India; 2 species in South Africa, recorded from the south-western districts.

6017

20. PTYCHOTIS, Koch

Flowers bisexual. *Calyx-teeth* 5. *Petals* obovate, bifid or emarginate, with a long inflexed point from the sinus. *Disc* sub-depressed or conical. *Fruit* compressed, ovate or oblong, smooth. *Mericarps* with 5 equal primary veins, with a single oil-tube in each furrow, and 2 oil-tubes on the face. *Carpophore* bipartite.

Annual or biennial herbs; leaves bipinnate, with the lobes pinnatifid, or the leaves cut into numerous filiform segments; inflorescence an axillary compound umbel; involucre wanting; involucels of several bracts.

Species about 6, natives of Africa and Europe; 3 species in South Africa, recorded from Natal and the south-western districts.

6020

21. CARUM, Linn.

Flowers bisexual. *Calyx-teeth* obsolete or nearly so. *Petals* obovate or elliptic, emarginate, with an inflexed point. *Disc* depressed or shortly conical. *Fruit* ovate or oblong, contracted from the sides. *Mericarps* with 5 filiform equal primary veins, with 1 oil-tube in each furrow and 2 oil-tubes on the inner face. *Carpophore* free, forked, or bipartite. *Seed* terete-convex, flattish on the inner face.

Much-branched biennial or perennial herbs; leaves pinnate, with the segments or leaflets multifid; inflorescence a compound umbel; involucre and involucels variable, often wanting.

Species about 22, natives of Europe, Asia, and North America; 1 species occurs in South Africa, extending from the south-western districts to the Uitenhage district and Little Namaqualand.

6033

22. PIMPINELLA, Linn.

Flowers bisexual. *Calyx-teeth* obsolete. *Petals* obovate, emarginate, with a long inflexed appendage at the apex. *Disc* cushion-shaped, or broadly or narrowly conical, with an entire margin. *Fruit* ovate or broader than long, laterally compressed, smooth or hairy, crowned with the reflexed styles. *Mericarps* sub-terete, 5-angled, with 5 filiform equal primary nerves and many oil-tubes in the furrows. *Carpophore* 2-fid or 2-partite. *Seed* somewhat flat or concave on the face.

Perennial, rarely annual, herbs; leaves often radical, pinnate, ternate, or pinnately decompound, rarely undivided and toothed; inflorescence a compound umbel; involucre usually wanting, more rarely of 1-2 bracts; involuclcs wanting or of few, very rarely many, bracts.

Species about 200, found in almost all temperate, tropical, and sub-tropical countries; 3 species occur in South Africa, extending from the Transvaal and Natal to the Uitenhage district.

6038

23. SIUM, Linn.

Flowers bisexual. *Calyx-teeth* 5, acute. *Petals* obcordate, with an inflexed point. *Disc* depressed or shortly conical, with an entire margin. *Fruit* ovate or oblong, laterally compressed or contracted. *Mericarps* sub-5-angled, with the primary veins filiform equal and obtuse, with many oil-tubes in the furrows and inner face. *Carpophore* obsolete, or undivided, or bi-partite. *Seed* sub-terete.

Mostly aquatic herbs; leaves pinnate, with the pinnae toothed; inflorescence a compound umbel; involucre and involuclcs of many long persistent bracts.

Species 10, natives of the northern hemisphere and Africa; 1 species found in South Africa, extending from the Transvaal and Natal to Riversdale; also found in the north-western and some central districts.

6042

24. SESELI, Linn.

Flowers bisexual. *Calyx-teeth* prominent or almost absent. *Petals* ovate, with a long inflexed point, emarginate or nearly entire. *Disc* depressed or conical, more or less undulate or erenate. *Fruit* ovoid or oblong, sub-terete. *Mericarps* compressed from the back, with 5 filiform equal obtuse veins, with a solitary oil-tube under the furrows and 2 oil-tubes, rarely 4, under the inner face. *Carpophore* bi-partite.

Perennial or biennial herbs; leaves ternately pinnate or decompound, with the segments incised and sometimes filiform or sometimes broad; inflorescence a compound umbel; involucre of many or few bracts, sometimes absent; involuclcs of many bracts.

Species about 60, found in Europe, Asia, Australia, and Africa; 3 species occur in South Africa, extending from Natal to the Cape.

6045

25. POLEMANNIA, E. & Z.

Flowers bi-sexual. *Calyx-teeth* 5, short, persistent. *Petals* elliptic, entire, with an acuminate inflexed point. *Disc* conical, with entire margins. *Fruit* oblong or ovate, nearly cylindric in cross-section, crowned with the disc and short styles. *Mericarps* dorsally compressed, with 5 prominent obtuse primary veins and with a single oil-tube under each furrow. *Carpophore* bipartite. *Seed* semi-cylindric, flattened on the face.

Glabrous shrubs; leaves ternate or ternately pinnate, with the leaflets cuneate or trifid or undivided; umbels arranged in panicles on leafless stems; the terminal umbel compound; the lateral umbels simple; involucre and involuclcs of a few subulate bracts, or 0.

Endemic; species 2, found in the Transvaal and the eastern districts as far as the Katberg; also recorded from the Gariep and the Cape Peninsula.

6046

26. OENANTHE, Linn.

Flowers bisexual. *Calyx-teeth* 5, acute. *Petals* obovate, emarginate or 2-lobed, with a long inflexed point. *Disc* conical. *Styles* rigid, rarely deciduous. *Fruit* ovate, oblong, cylindric, pear-shaped, or globose, subterete in cross-section, often crowned with the persistent styles. *Mericarps* semi-terete, with 5 obtuse thickened primary veins and with solitary oil-tubes under the furrows. *Carpophore* indistinct or 0. *Seed* dorsally compressed, flat on the face.

Glabrous herbs, found in damp places or in water; leaves pinnate or pinnately decompound, rarely (in the South African species) reduced to a hollow linear petiole; inflorescence a compound umbel; involucre and involuclers of many undivided bracts, rarely bracts few or 0.

Species about 30, found almost all over the world; 1 species in South Africa, recorded from the south-western districts.

6062

27. FOENICULUM, Linn.

Flowers bisexual. *Calyx-teeth* absent. *Petals* sub-orbicular, with a subquadrate retuse point. *Disc* large, conical, entire. *Fruit* oblong, subterete in cross-section. *Mericarps* semi-terete, with 5 prominent obtusely keeled veins, with a single oil-tube under the furrows. *Carpophore* 2-partite. *Seed* dorsally compressed, with the face flat or slightly concave.

Biennial or perennial herbs; leaves pinnately decompound, with the segments linear or setaceous; inflorescence a compound umbel; involucre and involuclers absent.

Species 3 or 4, natives of the Canary Islands and the Mediterranean Region; 1 species naturalised in South Africa.

6063

28. ANETHUM, Tourn.

Flowers bisexual. *Calyx-teeth* absent. *Petals* sub-orbicular, with a square-retuse point. *Disc* flattened, with undulate margins. *Fruit* dorsally compressed. *Mericarps* with filiform equidistant primary veins with a broad solitary oil-tube under the furrows and 2 on the inner face; the 3 dorsal veins acutely keeled; the 2 lateral veins sub-obsolete and confused with the margin.

Annual glabrous herbs; leaves compound; the lower leaves pinnate, with broad obovate lobed leaflets; the upper leaves digitately trifoliate, with lanceolate leaflets; inflorescence a simple umbel clustered at the nodes; involuclers 0.

Species 2, natives of India and the Orient; 1 species naturalised in South Africa.

6069

29. CNIDIUM, Cuss.

Flowers bisexual. *Calyx-teeth* absent or very short. *Petals* ovate or obovate, emarginate, with inflexed points. *Disc* short, conical. *Fruit* ovoid, subterete in transverse section. *Mericarps* semi-terete, with the primary veins very prominent and more or less winged, with a single oil-tube under each furrow and 2 on the inner face. *Carpophore* bipartite. *Seed* semi-cylindric, flattened on the face.

Decumbent or erect perennial herbs or undershrubs; leaves mostly pinnatifid or multifid; inflorescence a compound terminal or lateral umbel; involucre 0, or of a few deciduous bracts; involucler of many small bracts.

Species about 15, natives of Europe and Asia; 2 species in South Africa, found on the sea coast from the Cape to Natal.

6078

30. ANNESORRHIZA, Cham. & Schlecht.

(Stenosemis, E. Mey.)

Flowers unisexual. *Calyx-teeth* 5, persistent, usually small. *Petals* elliptic, acuminate, more or less emarginate, with an inflexed point. *Disc* broadly conical. *Fruit* 5-angled, prismatic, crowned with the calyx and inflexed styles. *Mericarps* convex on the back, unequal, very rarely equal or sub-equal, with prominent scarcely winged veins; one 3-winged, with the central dorsal vein and 2 lateral veins wing-like and the intermediate veins filiform; the other 4-winged, with the central dorsal vein filiform and the lateral and intermediate veins winged, with a single oil-tube under the furrows and 2 on the inner face. *Carpophore* bipartite. *Seed* dorsally compressed, flat on the face.

Erect biennial or perennial herbs; radical leaves petioled, pinnati-partite; cauline leaves small and scale-like; rarely leaves all alike; inflorescence an umbel of many rays; involucre and involucels of usually many small bracts.

Endemic; species 12, extending from Clanwilliam to Natal and the Transvaal.

(Note.—*Levisticum grandiflorum* Sond. is a species of this genus.)

6103

31. CAPNOPHYLLUM, Gærtn.

Flowers bisexual. *Calyx-teeth* small or absent. *Petals* oblong, sub-emarginate, with an acute inflexed point. *Disc* depressed or sub-conical, often small, with the margin scarcely undulate. *Fruit* ovate or ovate-oblong, more or less dorsally compressed, surrounded by a flattened dilated ring. *Mericarps* convex on the back, rarely almost flattened, with the 3 dorsal veins thick-keeled and flexuose or tubercled, and with the 2 lateral veins passing into the dilated margin, with a solitary oil-tube under the furrow and 2 oil-tubes in the inner face. *Carpophore* 2-partite. *Seed* dorsally convex, flat on the face.

Diffuse or laxly branched annual herbs; leaves tri-pinnately decompose, with the segments thin or small; inflorescence a few-rayed umbel; involucre and involucel of 3-6 bracts with membranous edges.

Species 4, natives of Africa, the Canary Islands, and the Mediterranean Region; 1 species in South Africa, found in the south-western districts.

6116

32. PEUCEDANUM, Linn.

(Bubon, Linn.)

Flowers bisexual. *Calyx-teeth* 5, or nearly absent. *Petals* obovate, oblanceolate, or cuneate, emarginate or sub-entire, with an inflexed or involute point. *Disc* flattened or slightly conical. *Fruit* dorsally compressed, with a narrow flattened margin, or somewhat winged. *Mericarps* with equidistant or sub-equidistant veins with a solitary oil-tube under the furrows, very rarely under the veins, with 2 oil-tubes on the inner face; the dorsal veins filiform; the lateral confused with the dilated margin.

Glabrous perennial herbs or shrubs; leaves simply pinnate, tri-pinnate, or multifid; flowers in compound, usually many-rayed, umbels; involucre and involucels of many or few bracts:

Species over 100, found in Europe, Asia, and Africa; 28 species occur in South Africa, with a coastal distribution from the south-western districts to Nata and then into the Transvaal.

6120

33. PASTINACA, Linn.

Flowers bisexual. *Calyx-teeth* absent or minute. *Petals* sub-orbicular, involute, with the involute part broad and retuse. *Disc* depressed. *Fruit* somewhat longer than broad, compressed dorsally, surrounded by a dilated flattened margin. *Mericarps* with very slender veins, with the dorsal and 2 intermediate veins equidistant and the lateral near the outer edge of the dilated margin, with the oil-tubes solitary in the furrows and 2 or more on the inner face. *Carpophore* bipartite. *Seed* flattened.

Herbaceous plants with fusiform often fleshy roots; leaves pinnate, with the segments toothed or cut or lobed; flowers in compound umbels; involucre and involucels wanting.

Species about 14, natives of Europe, the Orient, and northern and western Asia; 1 species in South Africa, recorded from the Cape.

6129

34. CHORITAENIA, Benth.

(Pappea, Sond. and Harv.)

Flowers bisexual. *Calyx-teeth* short, broad, or wanting. *Petals* ovate, shortly acuminate, furnished externally with a longitudinal fold, dorsally biconvex, keeled on the inside, with an acute incurved point. *Disc* conical or depressed, with the margin a little dilated and undulate. *Fruit* ovate, dorsally compressed, crowned with the persistent styles, pilose. *Mericarps* somewhat convex on the back, covered with long club-shaped minutely tubercled and spreading hairs, intermingled with short hairs, with the primary veins very thin and with the marginal veins forming a broad densely villous-ciliate rim and with a series of oil-tubes beneath. *Carpophore* bipartite from the base, persistent after the fall of the mericarps.

An annual prostrate herb, with many stems; leaves irregularly subternately cut; the lower leaves with longer petioles; flowers in umbels which grow from the base of the stem at the origin of the branches and also from their apices; involucre and involucels similar to the leaves.

Endemic; species 1, recorded from the Transvaal, the Wittebergen, and the Herbert district.

6142

35. DAUCUS, Linn.

Flowers bisexual. *Calyx-teeth* acute or wanting. *Petals* often unequal, obovate, with an inflexed lobe; the outer petals usually larger and bifid. *Disc* a depressed cushion, or shortly conical. *Fruit* ovate or oblong, more or less dorsally compressed, or sub-terete. *Mericarps* sub-terete, or convex on the back, flat on the face, with the primary veins bristly and the secondary veins equally winged, with 1 row of spines, with a solitary oil-tube in the furrows under the secondary veins. *Carpophore* undivided or 2-fid.

Annual or biennial herbs, often setose-hispid; leaves pinnately decomposed, with narrow or small segments; flowers in compound umbels, with the outer rays longer than the inner; involucre of many bracts which are usually pinnatifid; involucels of many 3-fid or entire bracts, or 0.

Species about 60, natives of the Mediterranean Region, the Orient, Europe, Africa, America, and Australia; 1 species found as an escape in South Africa.

144. CORNACEÆ.

Flowers regular, unisexual or bisexual. *Calyx* cup-like and truncate, 4-5-toothed or -lobed, sometimes 0. *Petals* 0 or 4-5, rarely many, imbricate or valvate. *Stamens* equalling the number of the petals, rarely 2 or 4 times as many; filaments subulate or flattened; anthers

opening by lateral slits. *Ovary* inferior, 1-4-chambered, with a solitary pendulous ovule in each chamber, very rarely ovules 2 in each chamber; style short or elongated; stigma various. *Fruit* often a drupe. *Seeds* oblong, pendulous; embryo axile; endosperm present.

Trees or shrubs, glabrous or silky-pilose; leaves opposite or alternate, simple, entire, lobed, serrate, or toothed; stipules 0; flowers usually small; inflorescence an axillary or terminal panicle or cyme, more rarely a head surrounded by an involucre.

Genera 15; species over 100, most abundant in the temperate regions of the northern hemisphere.

6156

CURTISIA, Ait.

Flowers bisexual. *Calyx-tube* turbinate, 4-angled; limb 4-lobed; lobes triangular-ovate. *Petals* 4, triangular-ovate, pubescent without, valvate. *Stamens* 4, alternating with the petals; filaments subulate; anthers broad, cordate at the base. *Disc* tumid, 4-angled, pubescent. *Ovary* 4-chambered, with a solitary ovule in each chamber; style short, subulate; stigma 4-lobed. *Fruit* a small drupe, crowned with the calyx-lobes, 4-locular, 4-seeded. *Seeds* elongate-oblong; embryo elongated; albumen copious.

Tree; leaves opposite, simple, petioled, ovate or oblong, coarsely toothed, leathery, shining above, pubescent beneath; petiole pubescent-tomentose; flowers minute; inflorescence a terminal trichotomous pubescent-tomentose panicle.

Endemic; species 1, extending from the Cape to Natal and the Transvaal.

Note.—*Cornus capitata*, Wall. cited by Bows "The Flora of Natal and Zululand" is not a native plant, nor is it at all common in South Africa in cultivation.

145. ERICACEÆ.

Flowers bisexual, regular. *Calyx* free, or more rarely adnate to the ovary, 4-5-toothed, lobed, or -partite, persistent or deciduous; teeth, lobes, or segments equal or unequal, imbricate, valvate, or open in bud. *Corolla* gamopetalous, hypogynous, rarely arising from the middle of the ovary or from the top of an inferior ovary, 2-5-(rarely 6-10-) lobed, or of 3-7 free petals, deciduous or persistent, imbricate, contorted, or valvate in bud. *Disc* 0, or annular, or tumid, crenate or lobed. *Stamens* 3-14, hypogynous, epigynous, or adnate to the base of the corolla, very rarely attached to the middle of the ovary; filaments free or connate; anthers basifixed or dorsifixed, free or connate; thecae often free down to the middle or beyond, with or without apical or basal appendages, opening by pores or by longitudinal slits, or produced at the apex into tubes. *Ovary* superior or inferior, rarely half-inferior, 1-12-chambered; style filiform or cylindric; stigma simple, capitate or peltate, entire, lobed, or toothed. *Ovules* 1 to many in each chamber, axile, pendulous or rarely erect, anatropus. *Fruit* usually a loculicidal or septicidal capsule, rarely baccate or drupaceous, 1 to many-seeded. *Seeds* small or minute.

Shrubs, undershrubs, or small trees, sometimes epiphytes; leaves alternate, opposite, or whorled; stipules 0; inflorescence various; pedicels often bracteate.

Genera about 88; species about 1,500, distributed in all parts of the world.

Sub-family Vaccinoideæ: *Ovary* inferior.

Tribe Vaccinieæ (genus 1).

Sub-family Ericoideæ: Ovary superior.

Tribe **Ericææ**: Ovary 4- (rarely 5- or 8-) chambered, with many ovules in each chamber (genera 2-5).

Tribe **Salaxideæ**: Ovary 1-4-chambered, with a single ovule in each chamber (genera 6-24).

1. Ovary inferior **1. Vaccinium, Linn.**
Ovary superior 2
2. Ovary 1-chambered, with 2-5 ovules 3
Ovary 1-8-chambered, when 1-chambered then ovule solitary 5
3. Filaments free **14. Thamnus, Klotzsch**
Filaments united, at least in young flowers, sometimes torn apart by the enlarging ovary 4
4. Ovules 2 **23. Cocosperma, Klotzsch**
Ovules 4-5 **24. Lagenocarpus, Klotzsch**
5. Ovules 2-5 in each ovary-chamber, more rarely ovules many 6
Ovule solitary in each ovary-chamber 9
6. Stamens normally 8 7
Stamens 4-6 8
7. One calyx-segment distinctly larger than the others and outside them; anthers without appendages **3. Philippia, Klotzsch**
Calyx-segments equal; anthers mostly with appendages of various shapes **2. Erica, Linn.**
8. One sepal distinctly larger than the others; bracts absent **4. Ericinella, Klotzsch**
Calyx equal; bracts 2-3 **5. Blaeria, Linn.**
9. Ovary 1-chambered 10
Ovary 2-4-chambered 15
10. Stamens 8 11
Stamens 4, more rarely 3 or 5 12
11. Stigma simple; filaments free **11. Eremiopsis, N.E.Br.**
Stigma peltate; filaments connate at the base **19. Leptericia, N.E.Br.**
12. Stigma large, peltate or saucer-shaped **20. Scyphogyne, Brongn.**
Stigma thickened or capitate, rarely disc-like, but not large and peltate 13
13. Calyx and bracts villous or covered with gland-tipped hairs **10. Acrostemon, Klotzsch**
Calyx not villous nor glandular 14
14. Calyx fleshy, becoming much enlarged and very thick in fruit **16. Anomalanthus, Klotzsch**
Calyx not fleshy nor enlarged in fruit **15. Syndesmanthus, Klotzsch**
15. Stamens 8, rarely 5-7, but if so then filaments connate 16
Stamens 4, more rarely 6 or 5 or 7 17
16. Filaments free; stigma simple or minutely 4-lobed **6. Eremia, D. Don.**
Filaments connate, becoming separated by the enlarging ovary; stigma funnel-shaped **22. Salaxis, Salisb.**
17. Stamens normally 6, more rarely 5 or 7 18
Stamens 4 19
18. Calyx nearly flat, usually square in outline; leaves not woolly **7. Platycalyx, N.E.Br.**
Calyx 4-partite; leaves white-woolly **8. Hexastemon, Klotzsch**
19. Calyx villous, or with gland-tipped hairs, or lobes long-ciliate 20
Calyx not villous nor ciliate 21
20. Calyx villous or with gland-tipped hairs **10. Acrostemon, Klotzsch**
Calyx-lobes long-ciliate **9. Grisebachia, Klotzsch**
21. One calyx-segment larger than the others; stigma peltate or crater-like **21. Coilostigma, Klotzsch**
Calyx-segments equal; stigma simple, sometimes thickened, rarely sub-peltate 22
22. Corolla 2-lobed 23
Corolla not 2-lobed 24

23. Calyx tubular-campanulate or campanulate . . . 18. *Anisericca*, *N.E.Br.*
 Calyx of the lowest or of all the flowers dorsally flattened, 2-edged
 and 2-lobed . . . 17. *Sympieza*, *Licht.*
 24. Corolla very small . . . 13. *Thoracosperma*, *Klotzsch*
 Corolla much longer than the calyx . . . 12. *Simocheilus*, *Klotzsch*

6216

1. *VACCINIUM*, Linn.

Calyx 4-5-lobed. *Corolla* variously shaped, 4-5-toothed or -lobed. *Stamens* 8-10; anthers produced into 2 tubes, opening by pores or slits at the apex, sometimes spurred on the back. *Ovary* inferior, 4-5-chambered, or falsely 10-chambered owing to the intrusion of false partitions from the placenta; style slender; stigma simple or sub-capitate; ovules numerous or few in each chamber. *Fruit* a berry.

Shrubs or undershrubs, rarely trees; leaves alternate, evergreen or deciduous, entire or serrulate; flowers in fascicles, rarely solitary, bracteate, or inflorescence a raceme.

Species over 100, chiefly natives of the north temperate zone and mountains of the tropics; 1 species found in the northern Transvaal.

6237

2. *ERICA*, Linn.

Calyx mostly 4-partite, rarely 4-fid or 4-toothed. *Corolla* deciduous or rarely persistent, variously shaped, usually 4-lobed, less commonly 4-fid, rarely sub-4-partite. *Stamens* normally 8, rarely fewer or more; filaments free; anthers terminal or lateral, opening by lateral pores or slits, mostly with an appendage of various shapes. *Ovary* sessile or shortly stalked, mostly 4- (very rarely 8-) chambered, with 2 to many ovules in each chamber; style filiform; stigma simple, capitate, peltate, or cyathiform, very rarely 4-fid. *Capsule* variously shaped, with loculicidal dehiscence. *Seeds* minute.

Perennial shrubs, from a few inches to 10 ft., or rarely more; leaves 3-6-nate in whorls, less commonly scattered or opposite, mostly rigid and narrow, linear, trigonous; margins revolute and connate with the underside, leaving only a wide or narrow channel, or less commonly the leaves flatter, broader and "open-backed"; inflorescence an umbel or head, mostly terminal, or often clustered in the leaf-axils at the ends of partially or entirely arrested lateral branchlets, very rarely truly indefinite and racemose, or flowers solitary or more commonly 2-4-nate; pedicels 1-flowered, with 3 bracts, rarely bracts fewer, or very rarely none.

SUBGENERA.

- | | |
|--|-----------------------|
| 1. Flowers mostly corolline | 2 |
| Flowers mostly calycine | 4 |
| 2. Corolla tubular, over $\frac{1}{2}$ in. long, usually $\frac{1}{2}$ -1 in. long | <i>Syringodea</i> . |
| Corolla various, not tubular, if exceeding $\frac{1}{2}$ in. long then urceolate,
inflated, or with star-shaped lobes | 3 |
| 3. Corolla with star-shaped lobes; tube mostly elongate, or ampul-
laceous, or urceolate | <i>Stellanthæ</i> . |
| Corolla very rarely with star-shaped lobes, mostly less than $\frac{1}{2}$ in. long | <i>Euerica</i> . |
| 4. Corolla usually constricted at the mouth | <i>Chlamydanthe</i> . |
| Corolla usually widened at the mouth | <i>Platystoma</i> . |

Species over 500, natives of Africa, Europe, and the Orient; almost 500 species found in South Africa, mostly in the south-western districts but extending into Natal and the northern Transvaal; absent from the central districts.

6240

3. PHILIPPIA, Klotzsch

Calyx unequally 4-lobed or 4-partite, one segment distinctly larger than the others and outside them. *Corolla* very small, 4-lobed. *Stamens* 8; filaments free or connate; anthers without any appendages, opening by oblique pores. *Ovary* 4-chambered; style exserted, persistent; stigma large, peltate or saucer-shaped; ovules 2 or more in each chamber. *Fruit* a loculicidal capsule, with 1 or more seeds in each loculus.

Shrubs or undershrubs, with the habit of *Erica*; leaves shortly petiolate, grooved down the very convex back; flowers very small, in small terminal clusters; bracts none.

Species 30-40, natives of Africa and the Mascarene Islands; 4 species in South Africa, recorded from the south-western districts, Graaff-Reinet, and Natal.

6241

4. ERICINELLA, Klotzsch

Calyx unequally 3-4-partite or -lobed, one sepal distinctly larger than the others. *Corolla* very small, 3-4-lobed. *Stamens* 4-6; filaments free; anthers free or connate, with or without basal spurs. *Ovary* 3-4-chambered, with several ovules in each chamber; style persistent; stigma peltate.

Shrubs or undershrubs, with the habit of *Erica*; leaves grooved down the convex back; flowers very small, in small terminal clusters; bracts none.

Species 5 or 6, natives of Africa and Madagascar; 2 species in South Africa, recorded from the Graaff-Reinet and Queenstown districts.

6242

5. BLAERIA, Linn.

Calyx equally 4-lobed or -partite. *Corolla* small, tubular or campanulate, shortly 4-lobed, often 4-angled. *Stamens* 4-6; filaments free; anthers with or without basal spurs, opening by oblique pores or short slits. *Ovary* 4-chambered, with 2-5 ovules in each chamber; style filiform, persistent, much exserted (except in one species); stigma simple or slightly enlarged, peltate in one species. *Fruit* a 4-valved loculicidal capsule, with 1 to few seeds in each loculus.

Shrubs or shrublets, with the habit and foliage of *Erica*; leaves usually grooved down the back, rarely open-backed; inflorescence a 2 to many-flowered umbel, terminal and often head-like, or terminating very short axillary branchlets which are racemously arranged along the branches, rarely flowers axillary and whorled; bracts 3, rarely 2.

Species 21, all African; 14 species occur in South Africa, extending from the south-western districts to the Uitenhage district.

6243

6. EREMA, D. Don.

Calyx 4-partite, rather large proportionally to the corolla, campanulate; segments equal, or in one species with one rather larger than the rest, ciliate or hairy, but not woolly. *Corolla* urceolate, campanulate, or cup-shaped, shortly 4-lobed, not more than twice as long as broad. *Stamens* 8, included, equalling or very slightly exceeding the corolla-lobes; anthers bipartite. *Ovary* 2-4-chambered, with 1 pendulous ovule in each chamber; style usually shortly exserted; stigma simple or minutely 4-lobed.

Small heath-like shrubs or shrublets; leaves grooved down the convex back, spreading, not woolly; flowers small, in terminal clusters or on short lateral branchlets; bracts 3.

Endemic; species 4, extending from Clanwilliam to Mossel Bay.

6243a

7. PLATYCALYX, N.E.Br.

Calyx nearly flat, usually square in outline, 4-lobed. *Corolla* sub-globose or globose-ovoid, much contracted at the mouth, 4-toothed. *Stamens* normally 6, occasionally 5 or 7, exserted. *Ovary* 2-chambered, with 1 pendulous ovule in each chamber; style exserted; stigma simple.

A small heath-like shrublet; flowers small, 1-3 together, terminal; bracts 3. Endemic; species 1, recorded from the Riversdale district.

6243b

8. HEXASTEMON, Klotzsch

Calyx 4-partite; segments erect, white-woolly. *Corolla* elongated-ovoid, or inflated at the base and tubular above, 4-toothed. *Stamens* 6, much exserted. *Ovary* 2-chambered, with 1 pendulous ovule in each chamber; style much exserted; stigma minutely capitate or 2-lobed.

A small shrub or shrublet, with white-woolly leaves; flowers in small terminal clusters; bracts 3.

Endemic; species 1, recorded from the Caledon district.

6243c

9. GRISEBACHIA, Klotzsch

Calyx 4-lobed or -partite; tube usually 4-angled; lobes or segments sometimes unequal in breadth, long-ciliate. *Corolla* shortly 4-lobed; tube usually constricted at or above the middle, with the parts above the constriction cup-shaped or campanulate, and the part below it sharply 4-angled (in a few species without any constrictions). *Stamens* 4, included or rarely slightly exceeding the corolla-lobes; filaments shortly and broadly dilated, or somewhat crutch-like at their attachment to the back of the anthers, often hairy; anthers nearly or quite as broad as long, with their thecae entirely free from each other, with or without basal awn-like spurs. *Ovary* usually 2-chambered, rarely trigonous and 3-chambered, with a solitary pendulous ovule in each chamber; style exserted; stigma minute, simple or capitate. *Fruit* 2-3-locular, somewhat fleshy.

Heath-like shrubs or shrublets; leaves grooved down the convex back; flowers small, pedicellate or sessile, arranged either in 6-15-flowered globose heads which are terminal or lateral and sub-sessile on short branchlets, or only 3-4 together on minute axillary branchlets arranged along the branches; bracts 3.

Endemic; species 21, mainly in the Van Rhynsdorp and Clanwilliam districts, but also found in the south-western districts to Swellendam; recorded also from Calvinia and Ceres.

6243d

10. ACROSTEMON, Klotzsch

Calyx equally 4-lobed nearly or quite to the base, villous with long simple hairs, or covered with gland-tipped hairs. *Corolla* 4-toothed or -lobed, tubular or ovoid-tubular, 4-angled or cylindric, often contracted at the apex by the lobes becoming connivent. *Stamens* 4; anthers 2-5 times as long as broad, sometimes spurred at the base, wholly or partly exserted from the corolla, with the thecae never quite free to the base. *Ovary* 2-4-chambered (in one species only 1-chambered), with a solitary pendulous ovule in each chamber; style exserted; stigma simple or capitate. *Fruit* a loculicidal capsule.

Heath-like shrublets; leaves grooved down the convex back, mostly more or less pubescent; flowers shortly pedicellate, in terminal heads; bracts 3, clothed with long white hairs.

Endemic; species 9, in the south-western districts; also recorded from Ceres.

6243e

11. EREMIOPSIS, N.E.Br.

Calyx very deeply and equally 4-lobed. *Corolla* campanulate, 4-lobed, longer than the calyx. *Stamens* 8, included; anthers bipartite. *Ovary* 1-chambered, with one pendulous ovule; style included, at its base, abruptly curved down upon the side of the ovary, then erect and recurved at the apex; stigma simple. *Fruit* apparently indehiscent.

An erect branching shrublet, much resembling an *Eremia* or *Grisebachia eremioides* in general appearance; leaves small, spreading; flowers small, in small terminal clusters of 2-6; bracts 3.

Endemic; species 1, recorded from the Worcester district.

6244

12. SIMOCHEILUS, Klotzsch

Calyx oblong, obconic, campanulate, or tubular, sometimes becoming ovoid in fruit, coriaceous, or thick and fleshy, or thin, 4-toothed; tube 4-angled or 8-ribbed; teeth usually much shorter than the tube, sometimes equalling it. *Corolla* much longer than the calyx, tubular, tubular-campanulate, or funnel-shaped, often curved, minutely 4-lobed, usually more or less 4-angled. *Stamens* 4, always exerted when mature; anthers divided almost to the base, with or without spurs on the back or at the base. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style exerted; stigma minute, simple, slightly thickened or capitate. *Fruit* often only 1-locular.

Small shrubs or shrublets, resembling *Synthesmanthus*; leaves often with a ridge down the middle of the flattened upper side, concave and grooved down the back; flowers solitary, or 2 to several in a cluster or head, axillary and terminal; bracts 0, 1, or 3, adpressed to and coming away with the calyx.

Endemic; species 21, extending from Clanwilliam and Van Rhynsdorp to the Uitenhage district.

6244a

13. THORACOSPERMA, Klotzsch

Calyx minute, equally 4-lobed or -partite; tube very short or none, not angular. *Corolla* very small, ovoid, ovoid-oblong, or sub-campanulate, with 4 short connivent or erect lobes. *Stamens* 4; anthers exerted (except in one species), with or without basal spurs. *Ovary* 2-4-chambered, with 1 ovule in each chamber; style exerted; stigma small, simple or slightly obconically thickened or sub-peltate. *Fruit* sometimes 1-3-locular, usually 1-2-seeded.

Small shrubs or shrublets, with the habit of *Erica*; leaves flat or convex above, convex and grooved on the back; flowers small, in small axillary clusters along the branches on minute branchlets shorter than the leaves subtending them, or terminal on short lateral branchlets; bracts 1-3, adpressed to the calyx.

Endemic; species 6, extending from the south-western districts to the Uitenhage district.

6244b

14. THAMNUS, Klotzsch

Calyx campanulate, deeply 4-toothed. *Corolla* minutely 4-lobed and constricted at the mouth. *Stamens* 4, exerted; anther-thecae parallel, divided to three-quarters of the way down. *Ovary* 1-chambered, with 4 pendulous ovules suspended from the apex of a free-central 4-angled placenta; style exerted; stigma simple. *Fruit* with 4 seeds, or seeds fewer by abortion.

A small heath-like shrub; leaves grooved down the convex back; flowers small, 1-7 together, axillary and terminal on short lateral branchlets; bracts 3, adpressed to the calyx.

Endemic; species 1, recorded from the Humansdorp and Uitenhage districts.

6244c

15. SYNDESMANTHUS, Klotzsch

Calyx variously shaped, 3-4-toothed; tube with or without 3-4 acute or obtuse angles. *Corolla* longer than the calyx, tapering from the apex or the middle to the base, or abruptly contracted into a very slender tube below, 3-4-lobed, often 3-4- (rarely 8-) angled. *Stamens* 3-4, always more or less exserted when mature; anthers bipartite, without spurs. *Ovary* 1-chambered, with a single pendulous ovule; style exserted; stigma minute, simple, capitate or thickened, rarely disc-like and produced into a short terete or clavate point near the centre or towards the margin.

Small heath-like shrubs or shrublets; leaves grooved down the convex back; flowers in few- or many-flowered terminal or axillary heads, sub-sessile, or very shortly pedicellate; bracts 0, 1, or 3, adpressed to and coming away with the calyx.

Endemic; species 19, extending from the south-western districts to George.

6244d

16. ANOMALANTHUS, Klotzsch

Calyx shortly 4-toothed, usually shortly campanulate, rarely 4-angled, fleshy, becoming much enlarged and very thick in fruit, with a contracted mouth. *Corolla* variously shaped, 4-lobed. *Stamens* 4, much exserted. *Ovary* 1-chambered, with 1 pendulous ovule; style much exserted; stigma thickened or capitate. *Fruit* small, apparently indehiscent and falling off enclosed in the fleshy calyx.

Small heath-like shrubs; leaves often with small leafy tufts in their axils, forming distinct whorls on the elongated branchlets; flowers solitary, or 2 to several in small clusters, axillary or at the ends of small axillary branchlets; bracts 3, coming away with the calyx.

Endemic; species 10, extending from the south-western districts to Riversdale.

6245

17. SYMPIEZA, Licht.

Calyx of the lowest or of all the flowers dorsally flattened, 2-edged and 2-lobed, of the central and upper flowers sometimes 3-4-angled, 3-4-lobed. *Corolla* tubular to funnel-shaped, 2-lobed. *Stamens* 4; anthers more or less exserted, bi-partite, without spurs, often scabrid. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style exserted; stigma simple, or slightly thickened, or minutely capitate. *Fruit* apparently 2-locular.

Small heath-like shrubs or shrublets; leaves grooved down the convex back; flower-heads terminal, sub-globose, erect or nodding; flowers sub-sessile, solitary in the axils of the bracts (floral leaves), the lower of which are leaf-like; bracts (besides the floral leaves) 0, or rarely 2.

Endemic; species 8, extending from Caledon to Swellendam.

6245a

18. ANISERICA, N.E.Br.

Calyx tubular-campanulate or campanulate, coriaceous, equally 4-toothed or 4-lobed. *Corolla* much longer than the calyx, tubular, 2-lobed. *Stamens* 4, exserted at maturity; anthers divided almost to the base, without spurs. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style exserted; stigma minute, simple.

A small heath-like shrub or shrublet; leaves grooved down the convex back; flowers small, numerous, in terminal clusters, mostly on short lateral branchlets which are often crowded at the ends of longer branchlets; bracts 0, except the minute floral leaves.

Endemic; species 1, extending from the south-western districts to George.

6245b

19. LEPTERICA, N.E.Br.

Calyx more or less unequally 4-lobed. *Corolla* very small, obovate, 4-lobed. *Stamens* 8, included; filaments connate at the base; anthers connate. *Ovary* 1-chambered, with 1 pendulous ovule; style stout, soon enlarging and forming a hollow conical top to the young fruit; stigma large, peltate. *Fruit* apparently indehiscent.

A shrub, with very copious slender sub-parallel branchlets; leaves small, adpressed; flowers minute, 1-3 together, axillary or terminal; bracts 0.

Endemic; species 1, recorded from the Riversdale district.

6246

20. SCYPHOGYNE, Brongn.

Calyx equally 3-4-toothed or -lobed. *Corolla* minute, 3-4-lobed or -toothed. *Stamens* 3-4, rarely 5; filaments free or connate; anthers included or partly exerted, notched at the apex, free or connate. *Ovary* 1-chambered, with a solitary pendulous ovule; style equalling the anthers or exerted beyond them; stigma large, peltate or erater-like.

Small heath-like shrubs or shrublets; flowers minute, axillary and terminal, 1-3 together, or several in small globose heads, sessile or minutely pedicellate; the corolla always less than 1-12th inch long; bracts 0.

Endemic; species 17, extending from Clanwilliam to Riversdale; also recorded from the Ceres district.

6246a

21. COILOSTIGMA, Klotzsch

Calyx unequally 4-partite, with one segment much larger than the rest. *Corolla* ovoid or cylindric, 4-toothed. *Stamens* 4; anthers divided nearly to the base. *Ovary* 2-4-chambered, with 1 pendulous ovule in each chamber; style exerted, sometimes becoming lateral in fruit by the abortion of an ovary-chamber; stigma peltate or erater-like.

Heath-like shrublets; leaves grooved down the convex back; flowers in small clusters; bracts none.

Endemic; species 4, recorded from the Riversdale, Alexandria, Uitenhage, and Albany districts.

6248

22. SALAXIS, Salisb.

Calyx more or less unequally 4-lobed, the larger lobe variably connate with the others or free nearly or quite to the base. *Corolla* campanulate or eup-shaped, 4-lobed. *Stamens* usually 8, rarely 6, included or exerted in fruit; filaments variously connate, becoming more or less separated with the enlargement of the ovary; anthers connate to the middle or beyond, sometimes becoming free in the fruit, notched at the apex, without spurs. *Ovary* 2-4-chambered, with a single pendulous ovule in each chamber; style distinct to almost none; stigma large, funnel-shaped, with the sides of the upper part of the eup erect or inflexed. *Fruit* apparently indehiscent.

Small heath-like shrubs or shrublets; leaves 3-nate, grooved down the convex back, usually thinly ciliate with very minute hairs or points; flowers very small and inconspicuous, axillary and terminal; bracts 0.

Endemic; species 7, extending from the Cape to Knysna.

6248a

23. COCCOSPERMA, Klotzsch

Calyx unequally 4-lobed; one lobe usually longer than the rest, often nearly free. *Corolla* longer than the calyx, shortly 4-lobed. *Stamens* 4-6, not exceeding the corolla except when pushed out by the fruit; filaments at first connate, becoming more or less separated by the enlargement of the ovary; anthers connate in the basal half. *Ovary* 1-chambered, with 2 large collateral ovules on one side of the cavity, or 2-3-chambered with 2 collateral ovules

in each chamber on the axile placenta ; style short ; stigma large, slightly exserted, flat or shallowly funnel-shaped at the bottom, with a narrow or deep and cup-like erect margin. *Fruit* 2-locular. *Seeds* flat one side, very convex on the other.

Erect much branched shrubs or shrublets, much resembling *Salaxis* in general appearance ; leaves 3-nate, linear, grooved on the convex back ; flowers axillary and terminal, sessile or very shortly pedicellate, on an extremely short minutely bracteolate branchlet which, together with the flowers, is very much shorter than the leaf from whose axil it arises ; bracts 0.

Endemic ; species 4, extending from Clanwilliam to Bredasdorp.

6248b

24. LAGENOCARPUS, Klotzsch

Calyx more or less unequally 4- (rarely 5-) toothed, obscurely angular. *Corolla* very small, slightly exceeding the calyx, or shorter than its longest lobe, arising from the middle or lower part of the ovary, with 4 (rarely 5) incurved tooth-like lobes. *Stamens* usually 8, occasionally 7, included, arising from the ovary or at the insertion of the corolla ; filaments connate into a tube, often becoming more or less torn asunder by the enlargement of the ovary ; anthers connate for half their length. *Ovary* quite free from the calyx, but half-inferior to the corolla, 1-chambered, with 4-5 pendulous ovules from near the apex of a central placenta which is only attached at the apex and base.

Small shrubs or shrublets, resembling a *Salaxis* in appearance ; leaves grooved down the back ; flowers 1-3 together, terminal, or on minute axillary branchlets which are shorter than the leaves and covered with minute bracts or very small leaves ; bracts 0.

Endemic ; species 2, extending from Paarl to Bredasdorp.

146. MYRSINACEÆ.

Plants sometimes diœcious. *Flowers* bisexual or unisexual, 5- or 4-merous, regular. *Calyx* 4-5-fid or -partite, sometimes sepals free ; lobes or sepals valvate, imbricate, or contorted, usually persistent. *Corolla* rotate, rarely campanulate or tubular, sometimes the petals free ; lobes or petals contorted, imbricate, or rarely valvate. *Stamens* as many as the corolla-lobes or petals and opposite to them ; filaments adnate to the corolla-tube, or rarely almost free ; staminodes 0. or 1 opposite each sinus of the corolla, rarely also opposite the corolla lobes. *Ovary* superior, more rarely half-inferior, 1-chambered, with few or many ovules on a free central or basal placenta ; stigma simple, rarely obscurely lobed. *Fruit* an indehiscent berry or drupe, rarely irregularly dehiscent. *Seed* with copious endosperm, rarely endosperm 0.

Trees or shrubs, rarely sub-herbaceous ; leaves alternate, often crowded at the end of the branches, rarely sub-opposite or sub-whorled, punctate or with schizogenous lines ; stipules 0 ; inflorescence terminal or lateral, a raceme or panicle ; flowers usually small.

Genera 32 ; species about 1,000, mostly tropical.

Tribe *Mæsææ* : Corolla gamopetalous ; ovary inferior or half-inferior ; fruit many-seeded (genus 1).

Tribe *Myrsinææ* : Corolla gamopetalous or polypetalous ; ovary superior ; fruit 1-seeded (genera 2-4).

- | | |
|---|----------------------------------|
| 1. Ovary inferior or half inferior | 1. <i>Maesa</i> , <i>Forsk.</i> |
| Ovary superior | 2 |
| 2. Petals free ; anthers shorter than the filaments | 2. <i>Embelia</i> , <i>Burm.</i> |
| Petals connate ; anthers longer than the filaments | 3 |
| 3. Filaments and style evident | 3. <i>Myrsine</i> , <i>Linn.</i> |
| Anthers sessile ; style absent | 4. <i>Rapanea</i> , <i>Aubl.</i> |

6283

1. MAESA, Forsk.

Plants diœcious. *Calyx* 5- (rarely 4-) lobed, bibracteate at the base ; lobes imbricate or quincuncial. *Corolla* 5- (rarely 4-) lobed, campanulate, rarely urceolate ; lobes obtuse, imbricate or quincuncial. *Stamens* inserted in the corolla-throat or below the throat ; filaments elongated or rarely shortened, very rarely almost 0. *Ovary* inferior or half-inferior, with numerous ovules on a basal placenta ; style short ; stigma capitate. *Fruit* small, dry or fleshy, indehiscent, crowned with the persistent style, surrounded by the persistent calyx, many-seeded.

Trees or shrubs ; leaves alternate, penninerved, sometimes gland-dotted ; inflorescence an axillary or terminal panicle or raceme, many-flowered ; flowers small, white.

Species about 125, natives of Africa and Asia ; 3 species in South Africa, found in the Transvaal, Natal, and the eastern districts to Komgha.

6310

2. EMBELIA, Burm.

Flowers often unisexual. *Calyx* 4-5-partite, -fid, or -lobed, sometimes almost free, imbricate or quincuncial. *Petals* 4-5, free, spreading or reflexed, imbricate or quincuncial. *Stamens* variously attached to the petals, rarely almost all free, longer than or sub-equalling the petals, rarely much shorter. *Ovary* in the male flowers much reduced ; in the female flowers sub-globose or ovoid, often pilose ; style short or long ; stigma discoid, entire, very rarely lobed. *Fruit* globose, or rarely depressed or obovoid, 1-seeded.

Shrubs or small trees, sometimes scandent ; leaves alternate, mostly entire ; inflorescence a raceme or panicle ; flowers minute or small, white, greenish, or yellowish.

Species about 125, mostly natives of Asia, Africa, and Madagascar : 1 species in South Africa, extending from Natal to Komgha.

6313

3. MYRSINE, Linn.

Flowers often unisexual. *Calyx* 4-5-partite, sometimes sepals free, usually imbricate. *Corolla* united at the base, very rarely to the middle, often ciliate, punctate, imbricate. *Stamens* longer or shorter than the corolla ; filaments evident, inserted near the base of the corolla. *Ovary* ovoid or ellipsoid, glabrous ; style evident, sometimes as long as the corolla ; stigma large, disciform, or with incised margins. *Fruit* globose, 1-seeded, fleshy.

Trees or shrubs ; leaves alternate, very often serrate or crenate ; inflorescence usually a small axillary tuft ; flowers small, pedicelled.

Species about 20, natives of China, India, and Africa ; 1 species in South Africa, widely distributed.

6314

4. RAPANEA, Aubl.

Flowers bisexual, sometimes unisexual. *Calyx* 4-5-partite, sometimes almost free, very often punctate, imbricate or valvate. *Petals* variously connate, spreading or recurved, very rarely erect. *Stamens* sessile, inserted in the throat of the corolla ; style in the female flowers 0 ; stigma sessile. *Fruit* dry or fleshy, 1-seeded.

Trees or shrubs ; leaves alternate, entire, very rarely toothed, often more or less with lepidote scales ; flowers small, arising on the branches.

Species about 150, found in most tropical countries ; 2 species in South Africa, extending from the south-western districts into Natal.

(Note.—Includes *Myrsine gilliana*, Sond. and *M. melanophlœs*, R.Br. of the "Plora Capensis.")

147. PRIMULACEÆ.

Flowers bisexual, often dimorphic, heterostylus, regular, very rarely zygomorphic. *Calyx* usually 5- (rarely 4-7-) fid or partite, persistent, often somewhat leafy. *Corolla-tube* short or elongated, sometimes almost absent; lobes 5, more rarely 4-7, imbricate, entire or emarginate. *Stamens* as many as the corolla-lobes and opposite to them, rarely with alternating staminodes. *Ovary* superior, rarely semi-inferior, 1-chambered, with few or numerous ovules on a free-basal sessile or stalked placenta; style terminal; stigma undivided. *Fruit* a capsule, variously dehiscent, few- or many-seeded.

Perennial or annual herbs, rarely shrubby; leaves radical, alternate, opposite, or whorled, simple or lobed; stipules 0; inflorescence a raceme, spike, panicle, or umbel, or flowers axillary and solitary.

Genera 22; species about 550, mostly in the temperate regions of the Northern Hemisphere, rare in the Southern Hemisphere and in the tropics.

Tribe **Samoleæ**: Corolla lobes imbricate or quincuncial; ovary semi-inferior (genus 1).

Tribe **Lysimachieæ**: Corolla lobes contorted; ovary superior (genera 2-3).

- | | |
|--|------------------------------|
| 1. Corolla-lobes imbricate; stamens alternating with staminodes; ovary half-inferior | 1. <i>Samolus</i> , Linn. |
| Corolla-lobes valvate; staminodes absent; ovary superior | 2 |
| 2. Filaments glabrous | 2. <i>Lysimachia</i> , Linn. |
| Filaments hairy | 3. <i>Anagallis</i> , Linn. |

6328

1. SAMOLUS, Linn.

Calyx 5-fid, persistent. *Corolla* sub-campanulate, 5-partite. *Stamens* inserted on the tube or in the throat of the corolla, alternating with the same number of staminodes; staminodes subulate or tongue-shaped, alternating with the corolla-lobes. *Ovary* half-inferior, globose; style short; stigma obtuse or capitate. *Capsule* opening by 5 valves.

Herbs, sometimes shrubby at the base, frequently found growing in marshy places near the sea; leaves alternate, sometimes in a basal rosette; radical leaves petioled; cauline leaves entire, diminishing upwards, or reduced to scales; inflorescence a terminal raceme or corymb; bracts at the base or middle of the pedicel.

Species 9, mostly natives of extratropical countries of the Southern Hemisphere; 2 species found in South Africa, extending from Natal through the coastal belt to Van Rhynsdorp, but also recorded from Bechuanaland and some of the north-western districts.

6330

2. LYSIMACHIA, Linn.

Calyx more or less deeply 5-6-partite. *Corolla* sub-rotate or campanulate, more or less deeply 5-6-partite; tube very short; lobes contorted, entire or toothed. *Stamens* inserted on the corolla-tube; filaments sometimes connate at the base; staminodes sometimes present, as many as the stamens. *Ovary* superior, globose or ovoid; style more or less filiform; stigma obtuse. *Capsule* usually opening by 5 valves at the apex, rarely irregularly dehiscent.

Procumbent or erect herbs; leaves alternate, opposite, or whorled, entire; inflorescence a spicate-raceme or a corymbose-panicle, sometimes umbellate or head-like; flowers white or yellow, rarely purple or blue.

Species about 116, found chiefly in Europe, Asia, and America; 3 species in South Africa, recorded from the Transvaal and Natal and then from the Uitenhage district to Humansdorp; also common on the Zuurberg Range near Grahamstown.

6338

3. ANAGALLIS, Linn.

Calyx 5-partite almost to the base ; segments lanceolate or subulate, spreading. *Corolla* 5-partite almost to the base, rotate or rotate-campanulate ; lobes obovate or linear, entire or crose, contorted. *Stamens* inserted at the base of the corolla ; filaments bearded, rarely glabrous. *Ovary* superior, globose ; style filiform ; stigma obtuse. *Capsule* globose, circumscissile.

Simple or branched creeping or erect herbs ; leaves opposite or alternate, rarely 3-nate, sessile or shortly petioled, entire ; flowers usually axillary and solitary, red, blue, or white, sometimes flowers in a lax raceme.

Species 28, natives of Europe, Africa, Asia, and America ; 3 species in South Africa, extending from the Transvaal through the coastal belt to the Cape.

148. PLUMBAGINACEÆ.

Flowers regular, bisexual. *Calyx* 5-10- or 15-ribbed ; tube cylindric, rarely campanulate ; limb usually 5-toothed or -lobed, membranous and hyaline between the lobes, introsely or extrosely rolled in bud, spreading in open flowers. *Petals* 5, connate at the very base only, or into a tube shorter or longer than the calyx, imbricate. *Stamens* 5, hypogynous, or adnate to the petals and opposite to them ; filaments filiform ; anthers ovate or oblong, dorsifixed ; thecae 2, parallel, opening by longitudinal slits. *Ovary* superior, sessile or stalked, 1-chambered, often 5-angled above, with a solitary pendulous ovule from an erect basal funicle ; styles 5, distinct or more or less connate ; stigmas capitate or linear. *Fruit* usually enclosed by the calyx, opening by an operculum, or circumscissile near the base, or 5-valved, sometimes indehiscent. *Seed* filling the loculus ; testa membranous ; endosperm floury, copious, scanty, or 0 ; embryo straight, terete or slightly compressed.

Acaulescent herbs, or with a short stalk and leaves in a rosette, sometimes suffrutescent, more rarely herbs or shrubs with elongated branched stems and alternate leaves which leave annular scars on falling off ; scape or peduncle terminal, dichotomously branched, more rarely simple ; flowers sessile or on a short thick pedicel, solitary or few in spikelets, often secund, rarely in heads, rose, violet, blue, or yellow, rarely white ; bracts usually rigid, scarious at the edge, one subtending each spikelet ; bracteoles 1 or more to each flower.

Genera 10 ; species about 280, in maritime and desert places, especially in the Mediterranean Region ; a few cosmopolitan.

Tribe *Plumbagææ* : Calyx-lobes or -teeth erect ; claws of the petals united into a tube ; stamens free or adnate to the tube ; style divided at the apex (genera 1-2).

Tribe *Staticeæ* : Calyx-limb often spreading, scarious, coloured ; stamens free or adnate to the corolla or petals ; styles distinct from the base or joined to the middle (genus 3).

1. Calyx glandular 1. *Plumbago*, Linn.
Calyx scarious or papery, not glandular 2

2. Calyx-limb spreading, scarious ; petals free or united at the base only
3. *Statice*, Willd.

Calyx papery ; corolla funnel-shaped 2. *Vogelia*, Lam.

6343

1. PLUMBAGO, Linn.

Calyx tubular, glandular, hyaline between the 5 ribs, persistent ; lobes 5, short, erect. *Corolla* salver-shaped ; tube slender ; lobes 5, spreading, equal or nearly so. *Stamens* free from the corolla ; filaments dilated at the base. *Ovary* tapering upwards ; style terminal, divided in the upper part into 5 branches stigmatic along their inner surfaces. *Capsule* membranous,

circumscissile near the base, the deciduous part often splitting into 5 valves from below. *Endosperm* scanty.

Perennial (rarely annual) herbs or shrubs, sometimes climbing; leaves alternate, eared at the base, or the petiole amplexicaul; flowers blue, rose, violet, or white; inflorescence a spike at the ends of the branches.

Species about 10, occurring in the warmer regions of both hemispheres; 2 species in South Africa, recorded from the Transvaal, Natal, and British Kaffraria to the Uitenhage district; also recorded from Somerset East and S.W. Africa.

6345

2. *VOGELIA*, Lam.

Calyx 5-partite almost to the base, strongly 5-ribbed, appearing winged from the out-turned margins of the segments, strongly wrinkled, persistent. *Corolla* funnel-shaped; lobes 5. *Stamens* hypogynous. *Ovary* more or less 5-angled; style terminal, with 5 arms stigmatose on the inner side. *Capsule* circumscissile at the base, and splitting upwards into 5 valves.

More or less scaly shrubs or undershrubs; leaves alternate, entire; inflorescence a dense terminal spike; bracts and bracteoles small.

Species 3, natives of Africa, India, and the Island of Socotra; 1 species in South Africa, recorded from Little Namaqualand and Calvinia.

6351

3. *STATICE*, Willd.

Calyx usually funnel-shaped; tube usually equally 10-ribbed at the base and the ribs uniting in pairs above, rarely 10- or 5-ribbed throughout; limb scarious, plicate, spreading, 5-toothed. *Petals* free, or connate at the very base. *Stamens* adnate to the base of the petals. *Styles* 5, distinct, rarely shortly united. *Fruit* included in the calyx, indehiscent or variously dehiscent. *Endosperm* scanty or copious, on one side of or all round the embryo.

Perennial, rarely annual, stemless herbs, or small shrubs branched from the base, pulverulent or lepidote; leaves radical, or cauline and alternate, flat; inflorescence a raceme, cyme, or panicle; peduncles terete or winged; bracts scale-like, small, enwrapping one or more flowers.

Species about 120, chiefly in the coast and desert regions of the northern hemisphere, some in Australia; 11 species in South Africa, found in the coastal belt from Namaqualand to Kentani; also occur in Griqualand West.

149. SAPOTACEÆ.

Flowers bisexual, regular. *Calyx* 4-5-partite. *Corolla* 4-8-lobed; lobes imbricate, sometimes in two series. *Stamens* inserted on the corolla, as many as the corolla-lobes and opposite to them, or more numerous and 2-seriate, sometimes with alternating staminodes; anthers usually extrorse. *Ovary* superior, many-chambered, with a solitary ascending ovule in each chamber; style conical or cylindric; stigma acute or capitate. *Fruit* a 1- or many-locular berry. *Seeds* with a hard testa; endosperm none or scanty; cotyledons foliaceous.

Trees or shrubs, with milky juice; leaves alternate, entire, exstipulate; flowers axillary.

Genera 18, with about 400 species, distributed throughout the tropics and a little way outside.

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|--|---------------------------------|
| 1. Stamines absent | 2. <i>Chrysophyllum</i> , Linn. |
| Stamens alternating with staminodes | 2 |
| 2. Corolla 5- (rarely 6-7-) fid or-partite | 1. <i>Sideroxylon</i> , Linn. |
| Corolla 18-24-partite | 3. <i>Mimusops</i> , Linn. |

6368

1. **SIDEROXYLON**, Linn.

Calyx 5-partite; the lobes imbricate. *Corolla* semi-5-fid or 5-partite; lobes usually spreading, imbricate. *Stamens* inserted on the corolla-tube opposite the corolla-lobes, alternating with 5 petaloid staminodes; anthers shorter than the filaments. *Ovary* hairy, 4-5-chambered. *Fruit* a berry with 1-3 seeds.

Trees or shrubs, with milky juice; leaves alternate, entire, often nerved; flowers white, pedicellate, in axillary tufts.

Species about 100, found almost throughout the tropics and sub-tropics; 2 species in South Africa, extending from the Transvaal to Natal, and in the coastal belt to the Cape.

6377.

2. **CHRYSOPHYLLUM**, Linn.

Calyx 5- (rarely 6-) partite; lobes imbricate, 2 outside. *Corolla* 5- (rarely 6-7-) lobed; lobes imbricate. *Stamens* as many as the corolla-lobes and opposite to them; anthers about equalling the filaments; staminodes none. *Ovary* hairy, 5-9-chambered; stigma obtuse, rarely acute. *Fruit* a 1 to few-locular berry, with 1 to few seeds.

Trees or shrubs; leaves entire, alternate, often silky beneath and transversely multistriate; pedicels axillary, in tufts, or flowers sessile; flowers small, white or yellow.

Species about 70, occurring in the tropics of both hemispheres; 3 species in South Africa, found in the Transvaal and Natal.

6386

3. **MIMUSOPS**, Linn.

Calyx 6-8-partite; lobes biseriate. *Corolla* 18-24-partite, with a short tube; segments 3 times as many as the calyx-lobes, biseriate; the outer row consisting of 12-16 linear spreading lobes, 2 opposite each calyx-lobe; the inner row of 6-8 linear erect lobes opposite the calyx-lobes. *Stamens* on the corolla-tube; the fertile as many as the calyx-lobes and opposite the inner corolla-lobes, alternating with ovate acute hairy staminodes which are sometimes 2-lobed or 2-partite. *Ovary* hairy, 6-8-chambered. *Fruit* a 1-2-locular berry with 1-2 seeds.

Trees or shrubs, with milky juice; leaves alternate, entire, mostly coriaceous and shining; flowers often fragrant, white, pedicellate, axillary, mostly in tufts.

A tropical genus of about 160 species; 11 species in South Africa, extending from the Transvaal, Natal, and the eastern districts to the Alexandria district.

150. **EBENACEÆ**.

Plants usually diœcious. *Flowers* regular, 3-8-merous, usually unisexual, sometimes bisexual, rarely unisexual with occasional bisexual flowers. *Calyx* free, often more or less accrescent in fruit, not petaloid, persistent. *Corolla* hypogynous, gamopetalous, deciduous, with the lobes sinistrorsely contorted in bud. *Stamens* in male and bisexual flowers 3 or more inserted at the base of the corolla or on the receptacle, usually in 1-2 rows; in female flowers 0, or usually represented by a few staminodes. *Disc* usually 0. *Ovary* superior, 2-16-chambered, with 1-2 pendulous anatropous ovules in each chamber; in the male flowers ovary abortive; stigmas small or somewhat dilated. *Fruit* a berry, sometimes coriaceous. *Seeds* few or solitary, pendulous; endosperm present.

Trees or shrubs, in a few species climbing; leaves normally alternate, entire and evergreen; stipules 0; flowers pedicellate; inflorescence a cyme or raceme, or flowers solitary, axillary or lateral; bracts usually present on the pedicels or peduncles.

Genera 6, with about 350 species, distributed over the warmer regions of the world.

- | | |
|--|-----------------------------|
| 1. Flowers 3-merous; ovules 2 in each chamber | 3. <i>Maba</i> , Forst |
| Flowers 4-8-merous; ovule solitary in each chamber | 2 |
| 2. Calyx not accrescent; inflorescence usually an axillary raceme or panicle | 2. <i>Euclea</i> , Murr. |
| Calyx accrescent; flowers usually solitary, sometimes inflorescence a cyme | 3 |
| 3. Stamens normally 10, in a single row | 1. <i>Royena</i> , Linn. |
| Stamens usually 16, in 2 rows | 4. <i>Diospyros</i> , Linn. |

6403

1. ROYENA, Linn.

Flowers bisexual or rarely unisexual, in most species 5-merous and solitary. *Calyx* pubescent, more or less accrescent in fruit. *Corolla* toothed or lobed. *Stamens* 5-14, in most species 10 inserted in 1 row, usually two in front of each corolla-lobe; anthers usually hispid. *Ovary* 2-10-chambered, hairy, with a solitary ovule in each chamber; style 2-5-cleft at the apex. *Fruit* 1-5-locular, more or less fleshy when ripe, sometimes splitting at the apex, covered at the base with the enlarged calyx.

Shrubs or small trees; leaves entire, normally alternate, very rarely opposite, more or less coriaceous.

An African genus of over 20 species; 17 species found in South Africa, widely distributed.

6404

2. EUCLEA, Murr.

Plants dioecious, or rarely with occasional bisexual flowers. *Calyx* 4- or 5-cleft, not accrescent in fruit. *Corolla* shortly lobed or cleft. *Stamens* in the male flowers 10-30, usually 12-20, either free, or in pairs, or the filaments connate at the base in one or two rows; anthers hairy or glabrous. *Ovary* abortive; styles 2 or style 1. *In female flowers* staminodes 0 or 2-4. *Ovary* usually 4- (rarely 2-) chambered, with a single pendulous ovule in each chamber; styles 2 (rarely 3) or, style 1 and bifid; stigmas emarginate or bifid. *Fruit* usually 1-locular and 1-seeded.

Shrubs or small trees; leaves alternate or rarely verticillate, entire, very rarely crenulate, evergreen; inflorescence an axillary raceme or panicle.

An African genus of over 25 species; 1 species occurs in Arabia; 17 species found in South Africa, widely distributed.

6405

3. MABA, J.R. & G. Forst.

Plants nearly always dioecious. *Flowers* usually 3-merous. *Calyx* lobed or truncate. *Corolla* lobed; lobes sinistrorsely contorted in bud as seen from above. *Stamens* in the male flowers 3 or more; in the female flowers obsolete or represented by staminodes. *Ovary* 3-6-chambered, with 2 ovules in each chamber; styles 1-3; in the male flowers the ovary and styles abortive and obsolete. *Fruit* baccate.

Trees or shrubs; leaves alternate, entire; flowers solitary, or inflorescence cymose, axillary or rarely lateral.

Species over 70, found in almost all tropical and sub-tropical countries; 1 species occurs in South Africa, recorded from Natal and East London.

6406

4. DIOSPYROS, Linn.

Plants usually dioecious. *Flowers* usually 4- or 5-merous. *Calyx* lobed or truncate, often accrescent in fruit. *Corolla* lobed; lobes sinistrorsely contorted in bud when seen from above. *Stamens* 4 or more, usually about 16 in two rows, obsolete in the female flowers, or represented by staminodes. *Ovary* 4-16-chambered, usually 8-10-chambered, with a single ovule in each chamber; in the male flowers abortive, rudimentary or obsolete; styles 1-4. *Fruit* usually with 1-10 seeds.

Trees or shrubs; leaves alternate, rarely opposite, entire; inflorescence a cyme, or flowers solitary.

Species over 200, found in almost all tropical, sub-tropical, and temperate countries; 2 species in South Africa, recorded from Delagoa Bay and the northern Transvaal.

151. OLEACEÆ.

Plants rarely dioecious. *Flowers* bisexual, rarely unisexual, or unisexual with occasional bisexual flowers. *Calyx* campanulate, 4- (rarely many-) toothed or lobed, rarely 0. *Corolla* gamopetalous, 4 to many-lobed, rarely polypetalous or 0. *Stamens* 2, rarely 4, alternating with the carpels, inserted on the corolla-tube. *Disc* 0. *Ovary* superior, 2-chambered, with 2 ovules in each chamber, rarely ovule 1 or ovules 4-8. *Fruit* a 2-valved loculicidal capsule, or a berry, or drupe. *Seeds* 2-4, or often solitary by abortion.

Trees or shrubs, sometimes climbing; leaves opposite, rarely alternate, simple or compound; stipules 0; inflorescence a cyme, panicle, or flowers fascicled.

About 20 genera; species about 300, found throughout the hot and temperate regions of the world.

Tribe **Syringææ**: Fruit terete, or compressed parallel with the septum, loculicidally dehiscent; ovules pendulous from the apex of each ovary-chamber; seeds winged, pendulous (genus 1).

Tribe **Oleineæ**: Fruit a drupe or berry, indehiscent; corolla various, often small; ovules 2 in each ovary-chamber, lateral near the apex; seed solitary, rarely seeds 2 (genus 2).

Tribe **Jasmineæ**: Fruit didymous or septicidally bipartite; corolla-lobes strongly imbricate; ovules attached laterally near the base of the ovary-chambers; seed erect (genera 3-4).

1. Corolla-tube longer than the calyx 2
- Corolla-tube short, scarcely exceeding the calyx 3
2. Corolla glabrous within 4. *Jasminum*, Linn.
- Corolla with short swollen hairs 1. *Schrebera*, Roxb.
3. Small undershrubs; leaves pinnately divided into linear lobes

3. *Menodora*, Humb. & Bonpl.

Tall trees or tall shrubs; leaves entire 2. *Olea*, Linn.

6422

1. SCHREBERA, Roxb.

Flowers bisexual. *Calyx* campanulate, shortly 4-8-toothed or sub-truncate. *Corolla* salver-shaped; tube cylindric; lobes 6-8, imbricate, more or less densely clothed with short swollen hairs inside. *Stamens* 2, rarely 4, inserted near the mouth of the corolla-tube. *Ovary* 2-chambered, with 3 or 4 ovules in each chamber pendulous from the apex; stigma shortly 2-fid. *Capsule* obovoid, separating through the middle into 2 septiferous boat-like valves. *Seeds* usually 4 in each loculus, pendulous, compressed, winged at the apex.

Trees or climbing shrubs; leaves opposite, entire or imparipinnate; inflorescence a terminal di- or tri-chotomous panicle.

Species 4, natives of India and Africa; 2 species in South Africa, recorded from the Transvaal and Natal.

6434

2. OLEA, Linn.

Plants sometimes dioecious. *Flowers* bisexual, more rarely unisexual, or unisexual with occasional bisexual flowers. *Calyx* 8-toothed or 4-fid. *Corolla-tube* short; lobes 4, induplicate-valvate, or 0. *Stamens* 2 (rarely 4), attached to the tube of the corolla. *Ovary* 2-chambered, with 2 ovules laterally fixed or sub-pendulous in each chamber; stigma capitate or shortly 2-fid. *Drupe* ovoid, oblong, or globose; endocarp bony or crustaceous. *Seed* usually solitary, pendulous.

Trees or shrubs; leaves opposite, entire or rarely toothed; inflorescence a trichotomous and fascicled axillary panicle, rarely a terminal panicle.

Species about 40, natives of central or tropical Asia, the Mediterranean Region, tropical Africa, the Mascarene Islands, and New Zealand; 8 species found in South Africa, extending from the Transvaal and Natal through the coastal districts to the Cape; also recorded from Somerset East and Graaff-Reinet.

6438

3. MENODORA, Humb. & Bonpl.

Flowers bisexual. *Calyx* with a wide turbinate tube and 5-15 linear lobes. *Corolla* 5-6-lobed; tube funnel-shaped, often hairy within; lobes imbricate. *Stamens* 2, attached to the corolla-tube, included. *Ovary* 2-chambered, thickened at the base, with 4, rarely 2, ovules in each chamber laterally fixed near the base; stigma capitate or shortly 2-lobed. *Capsule* membranous, didymous, splitting across. *Seeds* usually 8, or by abortion fewer.

Herbs or shrubs; leaves entire, toothed, or pinnately lobed; inflorescence a dichotomous panicle, or a simple axillary raceme, or the flowers solitary and terminal.

Species about 14, chiefly natives of North and South America; 3 species in South Africa, extending from the Transvaal to Natal, Bechuanaland, Griqualand West, and Namaqualand.

6440

4. JASMINUM, Linn.

Flowers bisexual. *Calyx* 4-10-lobed or -toothed, scarcely -partite. *Corolla* salver-shaped; tube cylindric; lobes 4-12 or sometimes more. *Stamens* 2, included. *Ovary* 2-chambered, with 2, rarely 3-4, ovules in each chamber attached near the base of the chambers; stigma oblong or capitate, often 2-fid. *Fruit* a twin berry. *Seed* often solitary, erect.

Shrubs, mostly climbers; leaves opposite or rarely alternate, trifoliate, or imparipinnate, or reduced to one leaflet; inflorescence a few or many-flowered cyme; flowers white or yellow, often sweetly scented.

Species about 120, natives of Asia, Africa, and Australia, with a few in southern Europe; 9 species in South Africa, occurring in the coastal districts from Natal to Van Rhynsdorp; also found in the Transvaal.

152. SALVADORACEÆ.

Plants sometimes dioecious. *Flowers* regular, bisexual or unisexual. *Calyx* campanulate or ovoid, 2-4-toothed. *Corolla* 4-lobed, or of 4 free petals, imbricate or valvate in bud. *Stamens* 4, inserted in the corolla-tube and alternating with the lobes, or hypogynous; filaments free, or connate at the base. *Disc* of glands, or scales, or none. *Ovary* superior, 1-2-chambered, with 1-2 erect anatropous ovules in each chamber; stigma entire or bifid. *Fruit* a berry or drupe, usually 1-seeded.

Shrubs or trees, unarmed or spiny; leaves opposite, entire; stipules rudimentary; panicles trichotomous, axillary, often reduced to sessile fascicles.

Genera 3 ; species about 10, found in tropical and sub-tropical Asia, Africa, and the Mascarene Islands.

Petals free ; ovary 2-chambered, with 2 ovules in each chamber

1. *Azima*, Lam.

Petals united ; ovary 1-chambered, with 1 ovule . 2. *Salvadora*, Garcin.

6444

1. AZIMA, Lam.

(*Monetia*, L'Her.)

Plants dioecious. *Calyx* campanulate, shortly 4-fid, or in the female flower irregularly 2-4-partite. *Petals* 4, distinct. *Stamens* 4, alternating with the petals. *Disc* none. *Ovary* 2-chambered, with 2 erect ovules in each chamber ; stigma large, 2-fid. *Fruit* a berry, usually 1-seeded by abortion.

Glabrous shrubs, very much branched or sarmentose ; spines axillary, solitary or in pairs ; leaves opposite, entire ; flowers small, axillary or along the branchlets of a short panicle.

Species about 6, natives of Madagascar, Africa, the Philippine Islands, eastern India and the Malay Archipelago ; 1 species found in South Africa, widely spread in the southern coast districts but does not reach the Cape Peninsula.

6446

2. SALVADORA, Garcin.

Calyx campanulate, 4-fid. *Corolla* campanulate, with a short tube and imbricate lobes. *Stamens* 4, fixed to the base or middle of the corolla-tube. *Disc* of 4 glands or scales alternating with the filaments, or none. *Ovary* 1-chambered, with a single erect ovule ; stigma truncate or nearly peltate. *Fruit* a drupe.

Shrubs or trees ; leaves opposite, quite entire ; flowers small, on the branchlets of axillary panicles, sessile or pedicellate.

Species about 3, natives of Africa, eastern India, and China ; 1 species occurs in South Africa and recorded from near Delagoa Bay.

(NOTE.—*Lauridia multiflora*, Engl. is *S. persica*, Garcin.)

153. LOGANIACEÆ.

Flowers bisexual, regular or slightly oblique. *Calyx* 4-lobed ; tube usually short. *Corolla* variously shaped ; lobes usually 4, occasionally 5, rarely 8-16, imbricate, contorted, or valvate. *Stamens* as many as and alternating with the corolla-lobes, inserted on the corolla-tube or in the corolla-throat ; filaments free, rarely connate below. *Disc* 0, or rarely a fleshy disc present. *Ovary* superior, 2-chambered, rarely 4-chambered by the development of placental dissippiments, rarely 1-chambered by the absorption of the dissippiment, with many ovules in each chamber ; stigma conspicuous or small, entire or obscurely 2-lobed. *Fruit* a capsule, septicidally 2-valved, or a berry. *Seeds* obovoid, oblong, or globose, sometimes angular or flattened by pressure.

Shrubs or trees ; leaves opposite, less often whorled, rarely fascicled, usually entire or sub-entire, occasionally distinctly toothed or lobed ; stipules usually reduced to an interpetiolar line, occasionally distinct ; inflorescence a cyme, rarely a raceme.

Genera about 30, with about 400 species, mainly tropical.

Tribe **Euloganiceæ** : Style simple, very rarely 2-3-lamellate ; stigma terminal, entire or sub-didymous ; ovules many in each ovary-chamber.

Sub-tribe *Strychnæ*: Corolla-lobes valvate; fruit a drupe or berry; trees or shrubs, often scandent (genus 1).

Sub-tribe *Fagraceæ*: Corolla-lobes contorted, overlapping to the right; fruit a berry; trees or shrubs, sometimes scandent; flowers often large (genus 2).

Sub-tribe *Buddleiæ*: Corolla-lobes imbricate or rarely contorted and overlapping to the left; fruit a septiceidal 2-valved capsule, or rarely a berry; trees or shrubs, rarely herbs; flowers often small (genera 3-6).

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|--|---------------------------------|
| 1. Corolla-lobes 8-16 | 2. <i>Anthocleista</i> , Afzel. |
| Corolla-lobes 4-5 | 2 |
| 2. Fruit a large globose berry; glandular hairs absent | 1. <i>Strychnos</i> , Linn. |
| Fruit a 2-valved capsule; glandular hairs present | 3 |
| 3. Inflorescence a simple or branched raceme | 4. <i>Gomphostigma</i> , Turcz. |
| Inflorescence a cyme, in axillary heads or corymbs, or in terminal panicles | 4 |
| 4. Calyx shortly lobed; anthers exserted; anther-thecae cohering above, divergent below | 3. <i>Nuxia</i> , Lam. |
| 5. Calyx shortly or deeply lobed; anthers exserted or included; anther-thecae separate, parallel | 6 |
| 6. Calyx deeply lobed; anthers exserted | 5. <i>Chilianthus</i> , Burch. |
| Calyx shortly lobed; anthers included | 6. <i>Buddleia</i> , Linn. |

6460

1. STRYCHNOS, Linn.

Calyx deeply 5- or 4-fid; tube sometimes obsolete; lobes imbricate. *Corolla* 5- or 4-fid; lobes valvate-spreading or reflexed, rarely sub-erect. *Stamens* 5 or 4, usually adnate to the corolla-throat, rarely low down in the corolla-tube; anthers exserted, rarely included, with the thecae distinct and parallel. *Ovary* 2-chambered, rarely 1-chambered by absorption of the dissepiment, with several, rarely many, very rarely few ovules in each chamber; stigma capitate. *Fruit* a globose berry, usually 2-locular, sometimes 1-locular; pericarp crustaceous. *Seeds* embedded in pulp, usually several, rarely by abortion only 2 or 1, variously compressed, sometimes globose or oval.

Erect trees or shrubs, or climbing by hooked tendrils, usually glabrous, armed or unarmed; leaves decussate, entire, petioled; stipules represented by an interpetiolar ridge, or 0; inflorescence a cyme, simple or in condensed or lax thyrsoid or corymbose panicles, axillary or terminal; bracts small.

Species about 100, wide-spread in all tropical and a few sub-tropical countries; 8 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district.

6466

2. ANTHOCLEISTA, Afzel.

Calyx deeply 4-fid; tube almost obsolete; lobes very thickly coriaceous, orbicular, imbricate. *Corolla* 8-16-fid; tube narrow-campanulate; lobes overlapping to the right, twisted to the left. *Stamens* 8-16, adnate to the corolla-throat; filaments flattened below, connate into a membranous ring; anthers exserted, sagittate, with the thecae distinct and parallel. *Ovary* 2-chambered, or by development of placental dissepiments 4-chambered, resting on a fleshy disc, with many ovules in each chamber; stigma dilated, oblong-capitate or shortly cylindric. *Fruit* a globose or oblong 4-locular berry. *Seeds* small.

Trees or shrubs, sometimes climbing, armed with axillary spines or unarmed; leaves mostly near the ends of the shoots, large or very large, decussate, petioled or sessile, entire; leaf-sheaths auricled or not, united by an interpetiolar ridge, or connate laterally into a short sheathing cup; inflorescence a cyme, in lax terminal panicles, with thick peduncles; flowers with a short stout pedicel; bracts scale-like.

Species about 20, mostly found in tropical Africa, a few in the Mascarene Islands; 1 species found in Swaziland.

6469

3. NUXIA, Linn.

Calyx shortly 4-lobed ; tube campanulate ; lobes sub-valvate. *Corolla* 4-fid ; tube cylindric, circumscissile above the persistent base, with the throat partially occluded by a ring of hairs ; lobes imbricate. *Stamens* 4, adnate to the corolla-throat ; anthers exserted, with the thecae confluent at the apex, divaricate. *Ovary* ovoid, usually silky, with many ovules in each chamber ; stigma terminal, simple. *Fruit* a capsule, hardly exserted from the calyx, with septicidal dehiscence. *Seeds* oblong.

Erect shrubs or small trees, glabrous or pilose ; leaves shortly or distinctly petioled, decussate or 3-nately whorled ; stipules 0 ; interpetiolar ridge obsolete ; inflorescence a cyme, in dense or lax terminal thyrsoid panicles.

Species about 30, natives of Africa and Madagascar ; 6 species in South Africa, extending from the Transvaal and Natal to George ; also recorded from Griqualand West.

6470

4. GOMPHOSTIGMA, Turcz.

Calyx deeply 4-fid ; tube campanulate ; lobes imbricate. *Corolla* deeply 4-fid ; lobes imbricate, as long as the tube. *Stamens* 4, adnate to the throat of the corolla-tube ; anthers exserted, with the thecae distinct and parallel. *Ovary* with many ovules in each chamber ; stigma dilated, faintly 2-lobed. *Fruit* a capsule, longer than the calyx. *Seeds* obovoid or angular.

Branched shrubs or undershrubs, stellately lepidote or tomentose ; leaves 1-nerved, sessile, decussate or fascicled, linear, elliptic, or oval ; stipules represented by a distinct interpetiolar ridge ; inflorescence a terminal simple or branched raceme.

Species 2, natives of Africa ; both species found in South Africa, extending from the Transvaal and Natal to the Uitenhage district ; also found in the central and north-western districts.

6471

5. CHILIANTHUS, Burch.

Calyx deeply 4-fid ; tube very short ; lobes imbricate. *Corolla* 4-fid ; tube short, narrow-campanulate ; lobes imbricate. *Stamens* 4, adnate to the corolla-throat ; anthers exserted, with the thecae distinct and parallel. *Ovary* ovate, tomentose, with many ovules in each chamber ; stigma capitate or dilated. *Fruit* a capsule, ovoid or oblong, exserted from the calyx, with septicidal dehiscence. *Seeds* oblong, compressed and sometimes winged.

Shrubs or small trees, stellately tomentose or scurfy-lepidote ; leaves petioled, decussate, entire or toothed ; stipules represented by an interpetiolar ridge ; inflorescence a cyme, in dense or somewhat lax panicles ; flowers small, sweet-scented.

Endemic ; species 4, fairly widely distributed.

6473

6. BUDDLEIA, Linn.

Calyx shortly 4-fid ; tube campanulate ; lobes imbricate. *Corolla* 4-fid ; tube (in the South African species) long, cylindric, salver-shaped ; lobes imbricate. *Stamens* 4, adnate to the corolla-tube ; anthers included, cordate or 2-lobed at the base, with the thecae distinct and parallel. *Ovary* with many ovules in each chamber ; stigma (in the South African species) narrow-clavate, laterally decurrent. *Fruit* a capsule, ovoid, or oblong, or conical, exserted from the calyx, with septicidal dehiscence. *Seeds* oblong, compressed, fusiform, or discoid.

Shrubs or small trees, stellately-pubescent or tomentose ; leaves petioled, decussate, entire, crenulate, or toothed ; stipules leafy, or represented by an interpetiolar ridge ; inflorescence a cyme, usually dense, in corymbose thyrsoid or strict terminal panicles ; flowers often sweet-scented.

Species nearly 100, mostly found in tropical and sub-tropical Asia and America, a few species in tropical Africa; 3 species in South Africa, fairly widely distributed.

154. GENTIANACEÆ.

Flowers usually regular and bisexual. *Calyx* 4-6-lobed or -partite; lobes usually imbricate. *Corolla* gamopetalous; tube campanulate, funnel-shaped, or cylindric, sometimes with a constricted limb; lobes 4-6, contorted, imbricate, or induplicate-valvate. *Stamens* 4-6, inserted on the corolla-tube or in the corolla-throat alternating with the lobes; filaments filiform or dilated at the base; anthers sometimes spirally twisted, dehiscent by longitudinal slits or sometimes by apical pores or slits. *Disc* obsolete, or annular, or of 5 hypogynous glands. *Ovary* superior, 1-2-chambered and usually with numerous ovules in each chamber; style simple; stigma entire or 2-lobed. *Fruit* usually a capsule, more rarely a berry, usually dehiscent septicidally into 2 valves, sometimes dehiscence partial and 4-valved, occasionally indehiscent. *Seeds* sometimes winged; endosperm present.

Annual or perennial herbs, rarely shrubs, usually always glabrous; leaves usually opposite; inflorescence a terminal cyme, sometimes a panicle, or axillary and fasciculate, or flowers solitary.

Genera 64; species about 600, mostly found in temperate regions throughout the globe; also occur on tropical mountains.

Tribe **Exacææ**: Leaves opposite; corolla-lobes contorted; ovary 2-chambered (genera 1-2).

Tribe **Chironeææ**: Leaves opposite; corolla-lobes contorted, without nectaries; ovary 1-chambered; placentas intruded (genera 3-6).

Tribe **Sweetiææ**: Leaves opposite; corolla-lobes contorted, with basal nectaries on their inner face; ovary 1-chambered; placentas parietal (genus 7).

Tribe **Menyantheææ**: Leaves alternate, sometimes all radical; corolla-lobes induplicate-valvate; ovary 1-chambered; placentas parietal (genera 8-9).

1. Ovary 1-chambered 2
- Ovary 2-chambered 8
2. Leaves opposite; corolla-lobes contorted 3
- Leaves alternate, sometimes all radical; corolla-lobes induplicate-valvate 7
3. Corolla-lobes with basal nectaries; placentas parietal 7. *Sweetia*, Linn.
- Corolla-lobes without nectaries; placentas intruded 4
4. Flowers 4-merous 4. *Faroea*, Welw.
- Flowers 5-merous 5
5. Flowers in axillary fascicles; stamens inserted at the middle of the corolla-tube; filaments with a small double-hooded scale at the base 3. *Enicostemma*, Blume
- Flowers in terminal cymes; stamens usually inserted in the corolla-throat; filaments without scales at the base 6
6. Plants more or less pubescent; calyx-lobes without keels; disc present between the calyx and the corolla 6. *Orphium*, E. Mey.
- Plants glabrous; calyx-lobes keeled, without a disc between the calyx and corolla 5. *Chironia*, Linn.
7. Stem erect; leaves slightly cordate at the base, ovate, radical; inflorescence a panicle; fruit opening by 4 valves at the top 8. *Villarsia*, Vent.
- Stem floating or creeping; leaves deeply cordate at the base; flowers fascicled; fruit bursting irregularly or remaining closed 9. *Limnanthemum*, Gmel.
8. Disc-glands between the calyx and corolla 0; style usually with a 2-glandular swelling near the base 1. *Sebæa*, Soland.
- Disc-glands present between the calyx and corolla; style without a 2-glandular swelling 2. *Exochæmium*, Griseb.

6481

1. SEBAEA, Soland.

Calyx 4-5-lobed ; tube short ; lobes ovate, acute, sometimes acuminate, keeled or winged. *Corolla* 4-5-lobed ; tube cylindric ; lobes oblong, spreading, contorted. *Stamens* 4-5, inserted at or shortly below the corolla sinuses. *Stamens* included or exserted ; anthers with or without an apical gland, sometimes with 2 glands at the base. *Ovary* 2-chambered, with many ovules on axile placentas ; style usually with a pair of papillate or glandular patches like a tubercular swelling near the base (representing stigmatic surfaces) ; stigma frequently diploid, capitate, clavate, or bilobed, sometimes almost confluent with the swellings. *Fruit* a capsule, globose or ovoid, membranous or thinly coriaceous, dehiscent septically into 2 valves. *Seeds* many, minute and simple, or larger and ridged, or provided with frills.

Annual, biennial, or perennial herbs ; stems erect or more rarely procumbent, simple or branched, with decurrent wings ; leaves opposite, sessile, sometimes forming a radical rosette ; inflorescence a terminal and axillary dichotomous cyme, rarely flowers solitary ; flowers usually yellow, less commonly white.

Species about 100, natives of Africa, Madagascar, India, Australia, and New Zealand ; 71 species occur in South Africa, widely distributed in all the coastal districts ; rare in the central districts ; also found in Natal and the Transvaal.

6483a

2. EXOCHAENIUM, Griseb.

Calyx 4-5-lobed ; tube very short : lobes ovate-lanceolate, acuminate, keeled ; disc-scales in a ring between the calyx and corolla. *Corolla* 4-5-lobed ; tube constricted below ; lobes ovate or oblong. *Stamens* included, inserted below the corolla-sinuses ; anthers with apical glands and sometimes with 2 glands at the base. *Ovary* 2-chambered, with many ovules on axile placentas ; style without glandular swellings ; stigma elongated, clavate, covered with long papillae. *Fruit* a globose or ovoid coriaceous capsule, dehiscent septically into 2 valves. *Seeds* many, small, simple.

Annual herbs, apparently saprophytic or with mycorrhiza ; stems erect, simple or branched, with decurrent wings ; leaves opposite, sessile ; flowers yellow, less commonly white, solitary, or more rarely inflorescence a few-flowered terminal or axillary cyme.

A tropical African genus of 11 species ; 1 species found in South Africa, extending from the Transvaal into Natal, Basutoland, and the eastern O.F.S.

6484

3. ENICOSTEMMA, Blume

Calyx 5-toothed ; tube campanulate ; teeth lanceolate. *Corolla* 5-lobed ; tube cylindric below, narrowly funnel-shaped above ; lobes small, lanceolate. *Stamens* 5, inserted at the middle of the corolla-tube ; filaments with a small double-hooded scale at the base ; anthers straight. *Ovary* 1-chambered, with numerous ovules on little protruded placentas ; stigma capitate. *Fruit* an oblong capsule, dehiscent septically into 2 valves. *Seeds* numerous, globose, foveolate.

Erect perennial herbs ; leaves numerous, opposite ; flowers numerous, small, in axillary clusters.

Species 4, natives of Africa, tropical America, Madagascar, and Asia ; 1 species recorded from Delagoa Bay and the Transvaal.

6485

4. FAROA, Welw.

Calyx 4-lobed ; tube short, campanulate. *Corolla* 4-lobed ; tube not exceeding the calyx ; limb with 4 scales. *Stamens* 4, inserted in the mouth of the corolla-tube. *Ovary* 1-chambered, with numerous ovules on slightly intruded placentas ; stigma 2-lobed or simple. *Fruit* a sub-globose capsule, dehiscent septically into 2 valves. *Seeds* numerous, sub-globose, foveolate.

Annual, rarely perennial, branching herbs; leaves usually numerous, sessile; flowers in dense terminal or axillary clusters, minute.

An African genus of 10 species; 1 species recorded from Basutoland.

6503

5. *CHIRONIA*, Linn.

Calyx deeply 5-lobed; tube short, sometimes nearly obsolete; lobes usually keeled. *Corolla* 5-lobed; tube short; lobes contorted. *Stamens* 5, exserted, usually inserted in the corolla-throat, sometimes within the corolla-tube; anthers straight or spiral. *Ovary* 1-chambered, with numerous ovules on 2-fid placentas which are little intruded; stigma simple or 2-lobed. *Fruit* an ovoid or sub-globose capsule, dehiscing septicidally into 2 valves, very rarely (*C. baccifera*) a berry. *Seeds* numerous, globose, foveolate.

Annual or perennial glabrous herbs, often branched; leaves 1-3-nerved, usually numerous, sessile; inflorescence a cyme, or a panicle of cymes, or reduced to a single flower; flowers usually pink, rarely purple.

Species about 33, found in Africa and Madagascar; 25 species in South Africa, chiefly in the coastal districts, Natal, and the Transvaal; rare in the central districts.

6504

6. *ORPHIUM*, E.Mey.

Calyx 5-lobed; tube campanulate; lobes oblong, not keeled, separated from the corolla by an annular crenulate disc. *Corolla* 5-lobed; tube short; lobes contorted. *Stamens* 5, inserted in the corolla-throat; filaments flattened at the base; anthers erect, at length twisted. *Ovary* 1-chambered, with numerous ovules on protruded placentas; stigma capitate, dilated, simple. *Fruit* a narrow-ovoid capsule, dehiscing septicidally into 2 valves; valves with inflexed placenterous margins. *Seeds* numerous, foveolate.

An erect virgately branching shrub, pubescent or slightly glabrescent; leaves numerous, sessile; inflorescence a terminal leafy cyme, sometimes reduced to a single flower; flowers pink, showy.

Endemic; species 1, extending from Clanwilliam to Riversdale.

6512

7. *SWEERTIA*, Linn.

Calyx 4-5-lobed; tube short or obsolete. *Corolla* 4-5-lobed; tube very short and broad; lobes with solitary or paired basal glandular nectaries. *Stamens* 4-5, inserted in the corolla-sinuses, shorter than the lobes. *Ovary* 1-chambered, with numerous ovules on slightly intruded placentas; style short or obsolete; stigma 2-lobed. *Fruit* an oblong or lanceolate capsule, dehiscing into 2 valves. *Seeds* numerous, minute, compressed, often winged.

Annual or perennial herbs; leaves numerous, cauline, opposite, sessile, or very shortly petioled; the radical leaves narrowed to a petiole; inflorescence a terminal corymb or paniculate cyme; flowers blue, yellow, or white.

Species about 90, natives of Africa, Madagascar, Europe, and Asia; 1 species in South Africa, found in the Transvaal, Natal, and the eastern O.F.S.

6544

8. *VILLARSIA*, Vent.

Calyx deeply 5-lobed. *Corolla* 5-lobed; lobes induplicate-valvate. *Stamens* 5, adnate to the corolla-tube. *Ovary* 1-chambered, with usually numerous ovules on thickened parietal placentas, surrounded by 5 minute hypogynous glands; stigma 2-lobed. *Fruit* a sub-globose capsule, opening by 4 apical valves. *Seeds* few or numerous.

Herbs, usually palustrine; stems simple, with leaves reduced and scale-like or obsolete, or branching with a few cauline leaves; radical leaves long-stalked, entire or sinuately toothed; inflorescence a cyme, sometimes a panicle; flowers white or yellow.

Species 10, all Australian except one which occurs in South Africa and is found in marshy place from Tulbagh to the Uitenhage district.

6545

9. LIMNANTHEMUM, S.M.Gmel.

Calyx deeply 5-6-lobed. *Corolla* 5-6-lobed; lobes induplicate-valvate. *Stamens* 5-6, inserted in or below the corolla-throat. *Ovary* 1-chambered, with usually numerous ovules on parietal placentas, surrounded by 5-6 minute hypogynous glands; stigma 2-lobed. *Fruit* a globose ovoid or oblong capsule, indehiscent or irregularly rupturing. *Seeds* few or numerous.

Aquatic herbs; stems erect or stolon-like; leaves alternate or sub-opposite, orbicular, elliptic, or ovate, usually deeply notched at the base, with entire crenate or dentate margins; flowers solitary, or in pairs, or fascicled at the nodes, white or yellow.

Species about 20, found in all tropical and temperate regions; 1 species in South Africa, extending from the Transvaal and Natal to the Cape.

155. APOCYNACEÆ.

Flowers bisexual, regular. *Sepals* 5, very rarely 4, free or slightly (rarely more) united, often with glands near the base inside. *Corolla* glabrous, or more or less hairy within, sometimes with scales, or callous protuberances, or ridges in the tube or mouth; lobes usually convolute, overlapping and frequently also twisted, very rarely valvate. *Stamens* 5 (very rarely 4), inserted in the corolla-tube or mouth, alternating with the corolla-lobes; anthers frequently conniving in a cone, shortly and obtusely 2-lobed at the base, or sagittate with barren tails. *Disc* annular or cupular, 5-lobed, or consisting of 2-5 scales, sometimes more or less adnate to the ovary, or none. *Ovary* superior or slightly inferior, 1-2-chambered, with 1 to many anatropous usually pendulous ovules, with parietal, central, or ventral placentation, sometimes gynæcium of distinct carpels: style 1 or divided at the base; stigma entire or bifid, and frequently with a ring or other appendage at the base. *Fruit* baccate, drupaceous, samaroid, or consisting of 2 (rarely 3-5) baccate or follicular mericarps, rarely breaking up into 2 or 4 valves. *Seeds* various, frequently compressed, very often with a tuft of hairs at one or both ends, or winged, rarely with a plumose apical or basal awn.

Trees, erect or scandent shrubs, or perennial (very rarely annual) herbs, more or less laticiferous; leaves simple, generally opposite, sometimes whorled, rarely spirally arranged, entire; stipules (if present) short, intrapetiolar, very rarely one on each side of the petiole or represented by spines; inflorescence cymose, terminal or pseudo-lateral, or truly axillary; bracts usually small and deciduous; flowers small to large and then often showy.

Genera about 180, with over 1,000 species, found chiefly in the tropics of both hemispheres.

Tribe Plumerioideæ: Corolla salver-shaped, rarely funnel-shaped; lobes overlapping to the left, rarely to the right; anther-thecae polliniferous and dehiscing to the base or nearly so, not diverging below; ovary 2-chambered, or gynæcium of 2 (rarely 3-5) free carpels; stigma rarely hairy or with frill-like appendages; fruit baccate, drupaceous, or dry and follicular; seeds without a coma of hairs (genera 1-5, 8).

Tribe Tabernæmontanoideæ: Corolla similar to above; anthers diverging below and passing into barren tails; gynæcium of 2 free or joined carpels; fruit baccate or follicular; seeds without a coma of hairs (genera 6-7).

Tribe Echitoideæ: Corolla-lobes overlapping to the right very rarely to the left; anthers diverging below and passing into barren tails; gynæcium of free, rarely joined, carpels; fruit dry, follicular; seeds with a coma of hairs, rarely without (genera 9-13).

1. Ovary 1-chambered, with numerous ovules . . . 3. *Landolphia*, Beauv.
Ovary entire and 2-chambered, or gynæcium of 2 separate or partly
separate carpels; ovules 1 to many in each chamber . . . 2

2. Ovary entire, with 1-4 ovules in each chamber 3
Gynæceium of separate or partly separate carpels, with 2 to many
ovules in each ovary 4
3. Armed shrubs, with simple or forked spines, rarely almost spineless
Unarmed shrubs 2. *Carissa*, Linn.
1. *Acokanthera*, G. Don.
4. Ovules 2 in each ovary-chamber 8. *Rauwolfia*, Lindl.
Ovules numerous in each ovary-chamber 5
5. Stipules transformed into rigid spines 10. *Pachypodium*, Lin
Stipules 0, obscure, or distinct, but not spinous 6
6. Stipules distinct, very obtuse, united into a short tubular sheath 7
Stipules 0 or obscure 8
7. Sepals free, not circumscissile at the base 6. *Conopharyngia*, G. Don.
Calyx tubular or sub-campanulate, 5-lobed, circumscissile at the base
7. *Voacanga*, Thouars
8. Leaves spirally arranged; stems succulent 9
Leaves opposite; trees or shrubs 10
9. Unarmed 9. *Adenium*, R. & S.
Armed with spines at the base of the leaves 10. *Pachypodium*, Lindl.
10. Stamens inserted in the mouth of the corolla 13. *Wrightia*, R. Br.
Stamens inserted at the base of the corolla or on the corolla-tube 11
11. Stigma spindle-shaped 11. *Oncinotis*, Benth.
Stigma capitate or sub-capitate, with a fleshy wavy ring or frill at
the base 12
12. Calyx circumscissile; mericarps baccate 7. *Voacanga*, Thouars
Calyx not circumscissile; mericarps follicular 12. *Strophanthus*, D C.

6558

1. ACOKANTHERA, G. Don.

Sepals free or almost so, eglandular within, more or less scarious. *Corolla* salver-shaped; tube slightly widened near the mouth; lobes short, overlapping to the left. *Stamens* enclosed in the widened part of the tube; anthers produced into a short minutely pilose point, shortly 2-lobed at and dehiscing to the base. *Disc* 0. *Ovary* entire, 2-chambered, with a single pendulous ovule in each chamber; stigma conic or cylindric, with a ring of papillæ at the base and a minutely 2-lobed hairy apiculus. *Fruit* a globose or ellipsoid berry. *Seeds* 2 (or 1 by abortion), peltate, plano-convex.

Unarmed shrubs or small trees; axillary stipules 0; axillary glands 0 or very scanty and minute; leaves opposite, simple; inflorescence a very shortly pedunculate or sessile corymb, axillary, often reduced to clusters; flowers sub-sessile, white or tinged with pink, usually sweet-scented.

Species 3, natives of Africa and Arabia; 2 species in South Africa, extending from the Transvaal and Natal to Mossel Bay.

6559

2. CARISSA, Linn.

Sepals 5, very rarely 4, free or nearly so, eglandular, very rarely multi-glandular within. *Corolla* salver-shaped; tube slightly widening below the mouth or near the middle; lobes overlapping to the right, rarely to the left. *Stamens* enclosed in the widened part of the corolla-tube; anthers obtuse at the base and polliniferous to the base. *Disc* 0. *Ovary* entire, 2-chambered, with 1-4 (rarely many) ovules in each chamber; stigma with a 2-lobed hairy tip. *Fruit* a globose or oblong berry. *Seeds* usually 1-4, rarely more, peltate, plano-convex.

Much branched straggling and usually very spinous shrubs or small trees, rarely climbing; spines opposite, simple, rarely forked, often very stout; leaves opposite, very variable in the same individual; axillary stipules 0; axillary glands very minute and few, or 0; inflorescence often an umbel or a

corymb and much contracted, terminal or pseudo-axillary, rarely a cyme, lax and few-flowered ; flowers sub-sessile, white, or tinged with pink.

Species about 19, extending into the tropics of the Old World and Australia ; 4 species found in South Africa, extending from the Transvaal, Zululand, and Natal to Swellendam ; also recorded from Somerset East.

6562

3. LANDOLPHIA, Beauv.

Sepals free, or connate below, eglandular. *Corolla* salver-shaped, with the mouth naked and sometimes much constricted by a callous ring ; lobes 5, overlapping to the left. *Stamens* included ; anthers minutely 2-lobed and dehiscent to the base. *Disc* 0. *Ovary* entire, 1-chambered, with numerous ovules from 2 parietal placentas ; stigma conical from a slightly thickened base, 2-lobed. *Fruit* a globose or pear-shaped berry, sometimes large. *Seeds* few or many, embedded in a juicy pulp.

Hairy or glabrous ; shrubs, often large, usually climbing by tendrils or sensitive inflorescences, rarely dwarf shrubs or undershrubs ; leaves opposite ; stipules 0 ; axillary glands minute, obscure, or subulate to filiform ; flowers rarely 2 in. long in bud, pedicelled or sessile, in few- or many-flowered corymbs at the ends of the branches, or gathered in more or less elongated panicles at the ends of their distant branches.

Species about 50, found in Africa and the Mascarene Islands : 4 species in South Africa, extending from Delagoa Bay into Zululand and from the Transvaal to Griqualand West.

6581

4. GONIOMA, E.Mey.

Sepals 5, free, eglandular within. *Corolla* salver-shaped ; tube cylindric, scarcely widened above the middle ; mouth constricted, without appendages, glabrous ; lobes 5, overlapping to the left, auricled at the base of the inner half. *Stamens* inserted at the middle of the corolla-tube ; anthers free from the stigma, shortly and obtusely 2-lobed at and dehiscent to the base. *Disc* 0. *Carpels* 2, free, with numerous ovules in each ovary ; stigma cylindric-oblong, exannular, apiculus subulate. *Mericarps* 2, follicular, oblong or linear-oblong, apiculate, sub-terete, straight or slightly curved. *Seeds* quite flat, broad-cuneate or rectangular, with a broad wing at each end.

A glabrous shrub ; leaves opposite or 3-4-nate, shining ; axillary stipules 0 ; axillary glands few, minute ; inflorescence terminal, densely corymbose ; flowers small.

Endemic ; species 1, extending from George to East London.

6597

5. LOCHNERA, Reichb.

Sepals 5, subulate, scarcely imbricate, eglandular within. *Corolla* salver-shaped ; tube slender, cylindric, slightly widened below the constricted callous velvety mouth ; lobes overlapping to the left. *Stamens* in the widened part of the corolla-tube ; anthers free from the stigma, shortly and obtusely 2-lobed at and dehiscent to the base. *Disc* replaced by two long linear glands, alternating with the carpels. *Carpels* 2, free, with numerous ovules in each ovary ; stigma depressed-capitate, viscous, with a long hyaline reflexed frill at the base and a minute obtuse 2-lobed apiculus surrounded by a very short erect membranous rim. *Mericarps* follicular, cylindric. *Seeds* numerous, small.

Annual or perennial herbs, or small undershrubs ; leaves opposite ; axillary stipules 0 ; axillary glands numerous in a fringe ; the outer long, filiform ; the inner minute ; flowers axillary, solitary or paired, white or pink.

Species 3, natives of tropical America, India, Madagascar ; 1 species naturalised in South Africa and recorded from Natal.

6605

6. CONOPHARYNGIA, G. Don.

Sepals almost free, imbricate, each with minute glands inside at the base. *Corolla* salver-shaped; tube cylindric, spindle- or barrel-shaped, widest at or below the middle, sometimes twisted, naked in the mouth, usually more or less tomentose inside; lobes overlapping to the left, inflexed and descending into the corolla-tube in bud. *Stamens* in the widened part of the corolla-tube; anthers conniving in a cone, sagittate at the base. *Disc* 0. *Carpels* 2, free, with numerous ovules in each ovary; stigma cylindric, grooved, with an entire or lobed projecting rim or short frill at the base and a minute 2-lobed apiculus, more rarely elliptic or globose, delicately papillose, not grooved, with a usually toothed rim at the base and a conspicuous 2-fid papillose apiculus as long as or rather longer than the rest of the stigma. *Mericarps* baccate, usually more or less globose or ovoid, smooth, rarely keeled or warty. *Seeds* numerous, embedded in a usually fleshy pulp, more or less ellipsoid, deeply grooved ventrally.

Trees, often tall, or shrubs; leaves opposite; axillary stipules distinct, very obtuse, united into a very short tubular sheath, usually with very numerous resiniferous glands within; inflorescence terminal or pseudo-axillary, corymbose, rarely paniced or reduced to few-flowered cymes; flowers large and showy to middle-sized, rarely small, usually white and fragrant.

Species about 25, natives of Africa and the Mascarene Islands; 2 species in South Africa, extending from Delagoa Bay to Natal and Pondoland.

6612

7. VOACANGA, Thour.

Calyx 5-lobed; tube tubular or sub-campanulate, early circumscissile at the base and deciduous, or more persistent, with a ring or zone of small glands at or above the base; lobes ovate, imbricate. *Corolla* salver-shaped; tube constricted below the middle and at the mouth, with callous thickenings round the often very narrow orifice, with prominent filamental ridges. *Anthers* adnate by a broad base to the corolla-tube above the constriction, deeply sagittate; tips subulate. *Disc* usually annular, very fleshy, surrounding the base of the ovary, or cupular and concealing the ovary, very rarely reduced to an inconspicuous ring. *Carpels* 2, free, very rarely connate to the middle, with numerous ovules on bifid placentas in each ovary; stigma sub-capitate, 5-grooved, with a fleshy wavy ring or frill at the base. *Mericarps* baccate, globose or pear-shaped. *Seeds* embedded in a pulpy mass, oblong, ellipsoid, deeply grooved ventrally.

Shrubs or trees, dichotomously branched; leaf-buds sometimes coated with resin; leaves opposite; axillary stipules distinct, or quite obscure, or 0; leaf-bases united into a rim or very short sheath; axillary glands small, numerous; inflorescence terminal, frequently paired, pedunculate, umbelliform or corymbose; usually from the forks of the young branches; corolla white, yellow, or greenish, or the limb violet-brown.

Species about 12, found in Africa, the Mascarene Islands, and the Malay Archipelago; 1 species in South Africa, recorded from Natal.

6619

8. RAUWOLFIA, Linn.

Calyx of 5 almost free sepals, or united into a 5-toothed cup, eglandular within. *Corolla* salver-shaped; tube slightly widened below the mouth, very rarely just below the middle; mouth constricted, without appendages, usually villous; lobes 5, overlapping to the left. *Stamens* in the widened part of the tube; anthers free from the stigma, shortly and obtusely 2-lobed at and dehiscing to the base. *Disc* annular or cup-shaped, entire or slightly lobed. *Carpels* 2, free, or more or less coherent, with 2 collateral ovules in

each ovary; stigma capitate, shortly cylindric, minutely papillose and slightly viscous, with a basal deflexed rim or membrane and a usually very short slightly bilobed apiculus rising from a shallow depression. *Mericarps* 2 (or often 1 by abortion), free or more or less united, drupaceous. *Seeds* ovoid.

Mostly glabrous trees or shrubs; leaves opposite or whorled, those of a whorl often very unequal; axillary stipules 0; axillary glands numerous, in a dense fringe or in clusters, frequently secreting resin; inflorescence terminal or pseudo-axillary, peduncled, few- or many-flowered, often repeatedly 2-3-chotomous, compound, an umbel, corymb, rarely a raceme.

Species over 50, found in the tropics of both hemispheres; 2 species in South Africa, recorded from the Transvaal, Natal, and Pondoland.

6680

9. ADENIUM, Roem. & Schult.

Calyx of 5 lanceolate or subulate sepals, eglandular within. *Corolla* funnel-shaped or campanulate, with paired small or obscure scales in the mouth of the tube; scales more or less confluent at the base and forming obtriangular pockets, alternating with the corolla-lobes; lobes 5, overlapping to the right. *Stamens* inserted at the base of the widened portion of the corolla-tube; anthers conniving in a cone, with long filiform terminal appendages and with basal appendages much longer than the polliniferous part; foot of the connective with a projection in the centre and a brush-like cushion below. *Disc* 0. *Carpels* 2, free, with numerous ovules in each ovary; stigma campanulate, capitate, with a broad rim and a minute bifid apiculus, agglutinated at the foot of the connective. *Mericarps* follicular. *Seeds* linear-oblong, covered with reversed hairs, with a deciduous coma at each end.

Succulent shrubs, often with swollen stems and fleshy branches; leaves in spiral and terminal fascicles; axillary stipules 0; axillary glands subulate, conspicuous, several in each leaf axil; inflorescence a few-flowered sub-sessile terminal cyme; flowers pink or purple, showy.

Species about 12, natives of Africa, Socotra, and Arabia; 3 species in South Africa, found in the Transvaal, Swaziland, Zululand, and Natal.

6681

10. PACHYPODIUM, Lindl.

Calyx of 5 sepals, eglandular within. *Corolla* salver-shaped; tube cylindric, widened below the middle, constricted at the base, or wholly cylindric, naked in the mouth; lobes 5, overlapping to the right. *Stamens* inserted above the constriction; anthers conniving in a cone, with terminal appendages longer or shorter than the polliniferous portion and tailed at the base; foot of the connective with a tongue-shaped projection and sometimes with a brush-like cushion below. *Disc* cupular, slightly 5-lobed, or replaced by 2-5 distinct glands. *Carpels* 2, free, with numerous ovules in each ovary; stigma sub-cylindric, with an annular rim or membrane at the base, very obscurely and obtusely 2-lobed. *Mericarps* follicular, spindle-shaped. *Seeds* ovate to oblong, with an apical coma.

Succulent shrubs, sometimes with a much swollen trunk; leaves in spirals, sub-sessile, stipulate; stipules transformed into rigid spines, or the leaves suppressed with the exception of a terminal rosette, and the spinous stipules crowded more or less irregularly on the swollen branches; inflorescence a few- or many-flowered terminal sessile or pedunculate cyme; flowers pink, white, or yellow.

Species about 12, found in Africa and Madagascar; 4 species in South Africa, found in the Transvaal, Bechuanaland, Griqualand West, S.W. Africa, Namaqualand, and the central districts.

6686

11. ONCINOTIS, Benth.

Calyx of 5 imbricate sepals, eglandular within, rarely with 5 minute glands. *Corolla* salver-shaped; tube widest at the middle, densely tomentose within, except at the very base, with 5 ligulate scales in the mouth alternating with the lobes; lobes overlapping to the right. *Stamens* inserted somewhat above the base of corolla-tube; filaments arching over the ovary, densely hairy on the inner side; anthers conniving in a cone, with apical appendages as long as the polliniferous part, shortly sagittate at the base; foot of the connective with a cushion of stout papillae at the base. *Disc* cupular, 5-lobed or 5-partite. *Carpels* 2, free, with numerous ovules in each ovary; stigma spindle-shaped, with a 2-lobed apiculus. *Mericarps* follicular, spindle-shaped. *Seeds* lanecolate, with an apical coma.

Scandent shrubs; leaves opposite; axillary stipules and glands 0; inflorescence a panicle of few- to many-flowered contracted cymes, axillary, or axillary and terminal, opposite or sub-opposite.

Species about 12, natives of Africa and Madagascar; 1 species in South Africa, recorded from Natal.

6688

12. STROPHANTHUS, DC.

Calyx of 5 imbricate sepals which are sometimes foliaceous. *Corolla* funnel-shaped or campanulate; tube cylindric, with paired appendages in the mouth alternating with the lobes; lobes 5, acuminate, or produced into very long filiform tails. *Stamens* inserted at the upper end of the cylindric portion of the corolla-tube; anthers conniving in a cone, acuminate, or sometimes produced into a long bristle, shortly sagittate at the base; foot of the connective with a central tuft of closely packed hairs in the upper part and a more or less hairy longitudinal crest below it. *Disc* 0. *Carpels* 2, free, with numerous ovules in each ovary; stigma capitate, 5-grooved with a membranous reflexed frill at the base and a minutely bifid apiculus. *Mericarps* follicular, oblong or spindle-shaped. *Seeds* spindle-shaped, slightly compressed, with an apical plumose awn and a deciduous basal coma.

Shrubs often scandent; leaves opposite, rarely ternate; axillary stipules 0; axillary glands subulate or conical, 2-6, rarely more, at the base of each petiole; inflorescence terminal, often on the ends of short branches, corymbose, many- or few-flowered, or reduced to solitary flowers; flowers mostly showy.

Species about 45, natives of Africa and tropical Asia; 3 species in South Africa, extending from Delagoa Bay, Zululand, and Natal to the Bedford district.

6689

13. WRIGHTIA, R.Br.

Calyx 5-lobed or more often with 5 free or almost free imbricate sepals, with 5-10 glands within. *Corolla* salver-shaped; tube cylindric, usually with connate or free appendages in the throat; lobes overlapping to the left. *Stamens* inserted in the mouth of the corolla; anthers conniving in a cone, long-sagittate at the base; foot of the connective rather flat, with a decurrent dense line of hairs in the centre. *Disc* 0. *Carpels* 2, free, with numerous ovules in each ovary; stigma capitate, with a small or obscure frill at the base and a minute cleft tip, agglutinated to the hair-tuft of the anthers. *Follicles* cylindric or spindle-shaped. *Seeds* cylindric, glabrous, with a basal tuft of hairs.

Shrubs or small trees, with slender branches; leaves opposite; axillary stipules 0; inflorescence a terminal or pseudo-axillary cyme; flowers small or rather large and then very showy.

Species about 20 all, except 1, in the warmer parts of Asia and northern Australia; 1 species in South Africa, recorded from Natal.

156. ASCLEPIADACEÆ.

Flowers regular, bisexual. *Calyx* of 5 free sepals, or rarely 5-lobed. *Corolla* gamopetalous, 5-lobed, very variable in shape and size; the lobes imbricate, contorted, or valvate in aestivation, sometimes connate at the tip, rarely connate into a column at the middle, then free and again connate at the tips, with the sinuses between them sometimes produced into teeth; 1-3 series of free or connate lobes, processes, keels, tubercles, or flaps arising from the corolla or the staminal whorl forming the *corona*, sometimes absent. *Stamens* 5, inserted at or near the base, rarely at the middle or in the mouth of the corolla-tube, alternating with the corolla-lobes; filaments sometimes free, but usually connate at their bases or throughout into a *staminal-column*, the apex often united to the dilated part of the style; anthers not connate or only by their appendages, free, or united to the dilated part of style, 2-chambered; connectives often produced into membranous or rarely fleshy or inflated terminal appendages, or apiculate, or unappendaged; appendages free or connate. *Pollen* granular or united into 1 or 2 waxy masses, attached in pairs or in fours, sometimes directly, but more usually by means of arm-like processes (*caudicles*), to each of the 5 small or minute horny or rarely soft bodies (*pollen-carriers*), when granular, each granule consists of 4 pollen-grains or of 3-5 grains in a row. *Gynaecium* of 2 one-chambered carpels, free below, but their styles united above and dilated at the middle or apex into a pentagonal disc; ovary superior, with usually numerous, rarely few or solitary, anatropous pendulous ovules. *Fruit* of 2 follicles, or by abortion of 1, variable in form, smooth, echinate, or winged, opening by the ventral suture and usually liberating the placenta. *Seeds* usually numerous, very rarely few or solitary, usually with a broad or narrow margin, crowned with a tuft of long silky hairs at one end, or rarely densely fringed all round, very rarely without a tuft of hairs.

Erect prostrate twining or scrambling herbs or shrubs, with milky or watery juice; stems simple or branched, sometimes appearing leafless or with very minute leaves, then often succulent, with terete or angular branches, often toothed or spiny at the angles; leaves opposite or whorled, rarely alternate, thin, coriaceous or fleshy; flowers very variable in size and form; inflorescence an umbel, umbel-like cyme, or raceme, axillary, more or less lateral between the bases of the leaves, or terminal, or flowers solitary, or few or many together.

Genera about 217: over 1,800 species known, widely spread throughout the tropical and sub-tropical regions: a few in temperate regions.

Tribe Periploceæ: Anthers produced at the apex into a fleshy apiculus or small fleshy or filiform or rarely membranous appendage, connivent over the style-apex and frequently connate at their tips; pollen-carriers spatulate, trumpet-shaped, or trowel-shaped, sometimes bipartite, horny, furnished with an adhesive gland at the base, not attached to the pollen-grains, but holding them loosely in the blade or concave part (genera 1-6).

Tribe Cynanchæ: Anthers erect, connivent-erect, or rarely divergent-erect, tipped with entire or rarely toothed or fringed membranous appendages, which are often inflexed over the style-apex or upon its rim; pollen-masses pendulous in the anther-thecae, opaque, very rarely with a small pellucid area just beneath the apex or sub-transparent at one end (genera 7-24, 47, 50).

Tribe Secamonæ: Anthers erect or ascending, with more or less fimbriated appendages; style-apex often exerted beyond the anthers (genus 25).

Tribe Marsdeniæ: Anthers erect or incurved-ascending, with, or rarely without, a membranous appendage at the apex; pollen-masses distinctly erect in the anther-thecae, opaque and usually not very minute, or rarely minute with a pellucid margin on one side (genera 26-32, 44-46, 48-49, 51-53).

Tribe Stapeliæ: Anthers sub-erect or incumbent upon the style-apex, without appendages; stems thick and fleshy, 3 to many-angled, usually dwarf, erect or procumbent or diving under-ground, tuberculate-tessellate, or toothed along the

- angles, appearing leafless, or the teeth tipped with rudimentary or small subulate fleshy leaves, or the tubercules or teeth stout and conical or spine-like or ending in slender bristles; flowers fleshy; corolla-lobes valvate in bud; corona arising from a staminal-column, none on the corolla. (genera 33-43)
1. Filaments of the stamens free; pollen of loose granules; each granule formed of 4 pollen grains united into a tetrad, or of 3-5 united in a row 2
 - Filaments of the stamens, when present, connate round the ovary into a tube which is sometimes very short and ring like; the top of the tube, or the anthers, or both, adnate to the dilated part of the style; pollen contents of each anther-theca united into 1 or 2 waxy masses; pollen carriers quadrate, turgid or rarely dorsally flattened, with a suture down the back, never spatulate nor trumpet-shaped 7
 2. Corolla with a distinct campanulate or cylindric tube; corona inserted at the middle or in the mouth of the corolla-tube 3
 - Corolla divided nearly to the base, without a distinct campanulate tube; corona from the corolla, at or near the base of the staminal-filaments 6
 3. Corona-lobes inserted on the corolla-tube distinctly above the base of the stamens, fleshy or subulate 4
 - Corona-lobes inserted on the corolla-tube with the stamens and occasionally on their filaments, entire, bifid, or trifid
 6. *Raphionacme*, *Harv.*
 4. Corona-lobes inserted at or about the middle of the corolla-tube; the connective of the anthers produced into a fleshy apiculus
 4. *Cryptolepis*, *R. Br.*
 - Corona-lobes inserted in the mouth of the corolla-tube; the connective of the anthers produced into a fleshy or hairy apiculus 5
 5. Corona-lobes clavate; apiculus of anther glabrous
 5. *Stomatostemma*, *N. & Br.*
 - Corona-lobes subulate; apiculus of anther filiform and hairy
 3. *Ectadium*, *E. Mey.*
 6. Corona-lobes filiform and simple, or divided above into 2 or 3 filiform segments; stipules represented by a line connecting the bases of the petioles 2. *Taczazea*, *Decne.*
 - Corona-lobes broadly obovate or obreniform, with or without an erect or incurved dorsal process; stipules well developed, toothed or frill-like 1. *Chlorocodon*, *Hook. f.*
 7. Pollen-masses 2 in each anther-theca, exceedingly minute and distinct, or the 2 are combined into one marked with a longitudinal suture and sometimes separable, seated directly on the pollen-carriers or upon a broad flap-like caudicle on their upper part, in fours or in pairs; pollen-carriers very minute, subquadrate, rather soft, pale-coloured 25. *Secamone*, *R. Br.*
 - Pollen-masses solitary in each anther-theca, attached in pairs to each of the pollen-carriers or to lateral expansions of them by long or short caudicles, or sessile in *Fockea*; pollen-carriers hard, horny, sometimes pale, but usually black, brown, or dark-coloured 8
 8. Pollen-masses pendulous in the anther-thecae 9
 - Pollen-masses erect, ascending, or horizontal in the anther-thecae, but never pendulous 31
 9. Corona none, or of 5 inconspicuous tubercles or scales on the corolla-tube, alternating with tufts of hairs near its base, middle, or top, none on the staminal-column 10
 - Corona distinct, adnate to the corolla-tube, or arising from the staminal-column, or in the angle between it and the corolla, or both on the staminal-column and the angle between it and the corolla 11
 10. Corona-lobes erect or spreading, not partly closing the mouth of the tube; corona none 8. *Astephanus*, *R. Br.*
 - Corolla-lobes connivent over or spirally arranged around and partly closing the mouth of the tube; corona-tubercles often present
 7. *Microloma*, *R. Br.*

11. Corona seated at the sinuses of and adnate to the corolla-tube . . .
 9. Parapodium, E. Mey.
 Corona from the staminal-column or in the angle between it and the
 corolla or both, none on the corolla 12
12. Stems erect, decumbent, or prostrate, never twining 13
 Stems twining or rambling 26
13. Corona of 5 distinct free lobes in one series; outer corona none or
 reduced to very minute lobules, teeth, or (in *Periglossum*)
 filiform processes, alternating with the lobes 14
 Corona-lobes united into a tube (at least at the base), or corona
 complex, or of 3 series of erect lobes 24
14. Corona-lobes laterally flattened, or at least measuring as much from
 front to back as in breadth, with the sides folded together through-
 out or at the base or apex **20. Asclepias, Linn.**
 Corona-lobes usually dorsally flattened, often thick and fleshy . . . 15
15. Corona-lobes shorter than corolla-lobes, very fleshy, often nearly
 or quite as thick as broad, without a fissure or cavity on the inner
 side **10. Xysmalobium, R. Br.**
 Corona-lobes longer or shorter than the corolla-lobes, variously
 shaped, very rarely somewhat thick and fleshy 16
16. Corona-lobes longer than the corolla-lobes 17
 Corona-lobes shorter than the corolla-lobes 18
17. Corona-lobes narrowly-lanceolate below, tapering into a subulate
 point, incurved at the apex, acutely keeled down the back, with
 no appendage or keel on the inner face **17. Krebsia, Harv.**
 Corona-lobes dorsally flattened, never complicate, having 2 keels
 (rarely without them) on the inner face . . . **11. Schizoglossum, E. Mey.**
18. Corona-lobes deeply trifold or quadrate, with square shoulders and
 an incurved mid-lobe, or produced into a short or long subulate
 or filiform point at the apex 19
 Corona-lobes not deeply lobed nor produced at the apex into pro-
 cesses 20
19. Corona-lobes deeply trifold or quadrate, with square shoulders and
 an incurved mid-lobe, with the margins incurved at the base and
 ascending the column as narrow wings **19. Woodia, Schltr.**
 Corona-lobes produced into a short or long subulate or filiform point
 at the apex, with 2 keels (rarely without them) on the inner face .
 11. Schizoglossum, E. Mey.
20. Corona-lobes linear, or linear-oblong, or a pair of contiguous fleshy
 erect lobes (keels), with or without a short point beyond 21
 Corona-lobes spathulate or hastately-spathulate 22
21. Corona-lobes with a distinct midrib and 2 erect basal lobules, but no
 keels **12. Fanninia, Harv.**
 Corona-lobes with or without 2 parallel keels, or large fleshy or wing-
 like erect contiguous lobes or keels at their base, and the upper
 part often curving over them, sometimes consisting of a pair of
 contiguous fleshy erect lobes (keels) with or without a short point
 beyond **18. Pachycarpus, E. Mey.**
22. Corona-lobes with a distinct claw and often petaloid blade
 18. Pachycarpus, E. Mey.
 Corona-lobes without a distinct claw and petaloid blade 23
23. Staminal-column sub-globose or globose-obvoid, constricted under
 the anther-appendages: style not exerted beyond the anther-
 appendages **14. Periglossum, Decne.**
 Staminal-column cylindric, not constricted under the anther-appen-
 dages: style exerted much beyond the anther-appendages
 13. Cordylogyne, E. Mey.
24. Outer corona of 20 segments; inner corona of 5 simple lobes; leaves
 palmately divided **16. Emicarpus, K. Schum. & Schltr.**

- Corona either of 5 lobes, very shortly connate at the base, or of 3 series of 5 simple or divided lobes; leaves linear, sometimes hastate 25
25. Corona of 5 lobes, very shortly connate at the base 14. *Periglossum*, *Deone*.
Corona of 3 series, with 5 lobes in each series 15. *Eustegia*, *R. Br.*
26. Corona in one series; no outer corona 27
Corona in 2 distinct series 30
27. Corona of 5 free simple lobes, laterally compressed and dorsally grooved 23. *Glossostephanus*, *E. Mey*
Corona of 5 free oboeonic or trumpet- or slipper-shaped lobes, or annular, cup-shaped, or tubular, or of 5 tubercles adnate to the staminal-column 28
28. Corona-lobes oboeonic, or trumpet- or slipper-shaped 21. *Pentarrhinum*, *E. Mey*.
Corona annular, cup-shaped, or tubular, or corona-lobes of 5 tubercles adnate to the staminal-column 29
29. Corona annular, cup-shaped, or tubular 22. *Cynanchum*, *Linn.*
Corona usually of 5 tubercles adnate to the staminal-column 47. *Tylophora*, *R. Br.*
30. Inner corona of 5 simple lobes: stem apparently leafless 24. *Sarcostemma*, *R. Br.*
Inner corona of 5 fleshy lobes, produced into a subulate incurved horn at the apex; leaves large, cordate 50. *Pergularia*, *Linn.*
31. Stems herbaceous or woody, with well developed leaves, rarely apparently leafless and then without distinct angles 32
Stems thick and fleshy, 3 to many angled, apparently leafless, or the teeth tipped with rudimentary or small subulate fleshy leaves 47
32. Corona none 44. *Rhyssolobium*, *E. Mey*.
Corona in 1 or 2 series, rarely tubular 33
33. Corona in 1 series, rarely tubular 34
Corona in 2 or 3 series, or falsely in 1 series of 3-fid lobes, or if in one series the corolla-lobes connate at the tips (*Riocreuxia*, *Decne.*) 43
34. Corona of 5 lobes on the corolla-tube and adnate up to its mouth 45. *Gymnema*, *R. Br.*
Corona arising from the staminal-column, or tubular 35
35. Corona of distinct lobes or tubercles, without a dorsal arm or appendage on the inner face 36
Corona-lobes with a subulate appendage or long filiform appendages on their inner faces, or sometimes tubular 41
36. Leaves broad (oblong, elliptic, ovate, or ovate-lanceolate) 37
Stems apparently leafless, or leaves linear or filiform 39
37. Corona-lobes Λ -shaped, adnate to the staminal-column, with free reflexed wing-like margins 27. *Orthanthera*, *Wight*.
Corona-lobes of fleshy tubercles or lobes 38
38. Corona of 5 small fleshy tubercles on the staminal-column much above its base: stems erect or tortuous, not twining 46. *Sphærocodon*, *Benth.*
Corona of 5 erect fleshy lobes adnate to the staminal-column, with free margins and tips; stems twining 49. *Marsdenia*, *R. Br.*
39. Corolla-tube exceedingly short, with very long linear-filiform reflexed lobes 28. *Macropetalum*, *Burch.*
Corolla-tube elongated, campanulate, or globose-campanulate, lobed to about $\frac{1}{2}$ way down 40
40. Corona-lobes Λ -shaped; shrubby plants with narrow leaves 27. *Orthanthera*, *Wight*.
Corona-lobes ovate or oblong and entire, or broadly-cuneate or subrhomboid and 3-toothed; stem usually simple, with linear leaves 26. *Sisyranthus*, *E. Mey*.
41. Corona tubular, arising in the angle between the staminal-column and the corolla 53. *Fockea*, *Endl.*
Corona of 5 lobes 42

42. Stems twining 51. *Telosma*, *Coville*
 Stems several, prostrate 29. *Anisotoma*, *Fenzl.*
43. Corolla-tube tubular, 2 to several times as long as its diameter at the middle, often inflated at the base 44
 Corolla-tube very small, sometimes none, not twice as long as its diameter at the middle, very rarely tubular and slightly inflated at the base 45
44. Inflorescence of laxly branching cymes, or in fascicles at the 2-3 nodes of simple peduncle-like flowering axes (which are bent at the nodes), with or without another fascicle at their base, or all compactly fasciculate at the nodes of the stem 32. *Riocreuxia*, *Decne.*
 Flowers solitary or in pairs, or inflorescence an umbel-like cyme or rarely a raceme, lateral at the nodes, rarely terminal 31. *Ceropegia*, *Linn.*
45. Leaves long-petioled, cordate at the base 48. *Emplectanthus*, *N.E. Br.*
 Leaves sessile or shortly petioled, very rarely sub-cordate at the base 46
46. Corolla-tube very short; lobes free, not reflexed; leaves linear or filiform 52. *Tenaris*, *E. Mey.*
 Corolla-tube campanulate, cup-shaped, or shortly tubular; lobes free, or connate at the tips, spreading, ascending, or reflexed; leaves various 30. *Brachystelma*, *R. Br.*
47. Corolla-lobes connate at the tips 43. *Pectinaria*, *Haw.*
 Corolla-lobes not connate at the tips 48
48. Stems covered with crowded pointless tubercles, or with 6 to many angles formed of closely-placed tubercles, each tipped with a slender spine of 3 bristles (see also *Huernia Pillansii*). 49
 Stems obtusely or acutely 4-6- (or in *Huernia* rarely 8-24-) angled; teeth of angles not tipped with slender spines or bristles (except in *Huernia Pillansii*), but sometimes stout and conical with hardened spine-like tips 51
49. Corolla-tube very small or none; outer corona of 5 spreading bifid or bipartite lobes, concave or pouch-like at the base, or the lobes united into a cup with emarginate or bifid lobes 50
 Corolla-tube $1\frac{1}{2}$ -3 in. long; outer corona-lobes divided into 10 filaments terminating in knobs 35. *Tavaresia*, *Welw.*
50. Corolla less than $\frac{3}{4}$ in. in diameter, lobed to half-way 34. *Trichocaulon*, *N.E. Br.*
 Corolla more than 1 in. in diameter, cup- or saucer-shaped, or nearly flat, sub-entire or obsoletely lobed 33. *Hoodia*, *Sweet*
51. Corolla with the angles between the lobes produced into distinct teeth 41. *Huernia*, *R. Br.*
 Corolla not produced into distinct teeth at the angles between the lobes 52
52. Corolla-tube with another tube within nearly as long as itself 42. *Diplocyatha*, *N.E. Br.*
 Corolla-tube none, or when present without another tube inside it 53
53. Outer corona present, distinct 54
 Outer corona none 56
54. Corolla with the disc raised into a tube-like rim supporting the corona 38. *Duvallia*, *Haw.*
 Disc not prominently raised and supporting the corona 55
55. Outer corona of 5 small lobes or pouches alternating with the anthers and more or less adnate to their base, or to the sides of the inner corona-lobes, rarely quite free to the base, usually bifid, sometimes so deeply that the whole corona appears to consist of 5 bifid lobes, or the lobes are united into an entire or 5-20-toothed ring or cup and connected to the backs of the inner corona-lobes 39. *Caralluma*, *R. Br.*
 Outer corona-lobes always very distinct, free to their base 40. *Stapelia*, *Linn.*
56. Corolla-tube campanulate, as long as the lobes 37. *Huerniopsis*, *N.E. Br.*
 Corolla-tube much shorter than the lobes, or none 36. *Piarranthus*, *R. Br.*

6729

1. CHLOROCODON, Hook. f.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona* of 5 lobes arising from the base of the staminal-filaments; lobes free, very broadly obovate or obreniform, with or without an erect or incurved dorsal process. *Stamens* rising from the base of the corolla; filaments free; anthers adnate to the dilated part of the style, connivent in a cone, connate at the tips. *Pollen* granular.

Tall climbers; leaves large, opposite, cordate; stipules well developed, toothed or frill-like; flowers of moderate size; inflorescence a paniculate cyme.

Species 2, both African; 1 species extends into Natal.

6730

2. TACAZZEA, Decne.

Calyx 5-partite. *Corolla* 5-lobed almost to the base. *Corona*-lobes 5, arising from the corolla at or near the base of the staminal-filaments and usually shortly adnate to them, filiform and simple, or linear and divided above into 2 or 3 filiform segments. *Stamens* inserted at or near the base of the corolla; filaments quite free, or free above and united at their base into a ring, with 5 minute sub-quadrate emarginate or bifid alternating lobules; anthers attached at their base to the dilated part of the style, connivent in a cone, cohering at their tips; pollen granular; pollen-carriers more or less spathulate. *Follicles* divergent. *Seeds* crowned with a tuft of hairs.

Twining or erect shrubs, with milky juice; leaves opposite or whorled; stipules usually represented by a transverse line (often with fleshy glands along it) connecting the petioles; flowers small; inflorescence an axillary paniculate or corymbose cyme, often from both leaf-axils.

Species about 15, all African; 2 species in South Africa, recorded from Natal and the Transkei.

6735

3. ECTADIUM, E. Mey.

Calyx 5-partite. *Corolla-tube* cylindric. *Corona* of 5 subulate lobes at the mouth of the corolla-tube. *Stamens* inserted at the bottom of the corolla-tube; filaments free; anthers adnate at their base to the dilated part of the style, produced above into a long erect appendage, hairy; pollen granular; pollen-carriers spathulate-oblong. *Follicles* widely divergent.

Shrubby plants, with erect virgate stems; leaves opposite; inflorescence a lateral cyme.

Endemic; species 2, found in S.W. Africa and Namaqualand.

6740

4. CRYPTOLEPIS, R.Br.

Calyx 5-partite. *Corolla* with a campanulate tube, and usually with small pocket-like flaps in the angles between the lobes. *Corona* of 5 fleshy lobes arising from about the middle of the corolla-tube. *Stamens* arising from the lower part of the corolla-tube; filaments free; the connective of the anthers produced into a fleshy apiculus united to the dilated part of the style at the base, more or less connivent in a cone; pollen granular; pollen-carriers more or less spathulate. *Follicles* linear-terete, sub-fusiform, or ovate, smooth. *Seeds* crowned with a tuft of hairs.

Erect or twining shrubs; leaves opposite; flowers small or of moderate size; inflorescence a sub-axillary or terminal cyme, or rarely flowers subsolitary.

Species about 12, distributed through the warmer parts of the Old World as far north as Cashmere; 5 species in South Africa, extending from the Transvaal and Natal into the Transkei.

6741

5. STOMATOSTEMMA, N.E.Br.

Calyx 5-partite. *Corolla-tube* broadly campanulate. *Corona* of 5 fleshy clavate lobes inserted in the sinuses between the corolla-lobes. *Stamens* inserted near the base of the corolla-tube; filaments free; anthers united at their base to the dilated part of the style, connivent in a cone, with the connective produced into a fleshy apiculus; pollen granular; pollen-carriers with the margins inrolled so as to nearly form an oblique-mouthed tube, broadly ovate when flattened out, grooved down the back.

A climbing or bushy shrub, with milky juice; leaves opposite; flowers of moderate size, in few-flowered cymes, axillary (often from both leaf-axils) and terminal, sometimes inflorescence an elongated terminal narrow panicle, sometimes somewhat corymbose.

Species 1, found in the northern Transvaal; also occurs in tropical Africa.

6747

6. RAPHIONACME, Harv.

Calyx 5-partite. *Corolla-tube* campanulate; lobes sometimes reflexed, often with 2 narrow ridges on their basal half. *Corona* of 5 free entire bifid or trifold lobes, inserted with the stamens and occasionally upon their filaments above the middle of the corolla-tube, or in the corolla-mouth. *Stamens* inserted above the middle or in the mouth of the corolla-tube; filaments free; anthers at their base adnate to the dilated part of the style, connivent in a cone and connate at their tips; pollen granular; pollen-carriers spatulate. *Follicles* often solitary by abortion, short or long, lanceolate in outline, fusiform, or linear-terete. *Seeds* crowned with a tuft of hairs.

Perennial herbs; rootstock a depressed or ovoid tuber, often having a long woody neck, or consisting of a cluster of long fusiform fleshy roots $\frac{1}{2}$ -1 in. thick; juice milky; stem usually dwarf, simple or branched, sometimes twining; leaves opposite; flowers small or of moderate size, in few- or many-flowered cymes or clusters, sub-axillary from one leaf-axil, lateral at the nodes, or terminal, or seated in the forks of the stem.

Species about 25, all African; 9 species occur in South Africa, extending from the Transvaal and Natal to the Alexandria district; also recorded from Griqualand West.

6752

7. MICROLOMA, R.Br.

Calyx 5-partite. *Corolla* 5-lobed; tube urceolate or tubular, 5-angled, furnished inside with 5 tufts of deflexed hairs opposite the lobes; lobes spirally arranged and more or less closing the mouth of the tube. *Corona* 0, or of 5 small tubercles or fleshy scales at the middle or near the apex of the corolla-tube, alternating with the hairy tufts. *Staminal-column* arising from the base of the corolla; anthers terminated by erect membranous appendages which are more or less connate at the tips; pollen-masses solitary in each theca, pendulous, attached to the pollen-carriers by short caudicles. *Follicles* solitary by abortion, fusiform, beaked. *Seeds* crowned with a tuft of hairs.

Perennial plants, with slender twining stems, or dwarf much-branched shrublets; leaves small, opposite; flowers in small umbel-like cymes, sub-axillary.

Endemic; species 10, found in the coastal districts from Namaqualand to Port Elizabeth; also in the central and north-western districts; apparently absent from the eastern districts, Natal, and the Transvaal.

6758

8. *ASTEPHANUS*, R.Br.

Calyx 5-partite. *Corolla* 5-lobed, with 5 hairy patches inside the tube. *Corona* none. *Staminal-column* arising near the base of the corolla-tube; anthers with erect membranous appendages; pollen-masses solitary in each anther-theca, attached to the pollen-carriers by short caudicles. *Follicle* solitary (always ?) terete-fusiform, tapering into a beak. *Seeds* crowned with a tuft of hairs.

Slender twiners; leaves small, opposite; flowers small; inflorescence a small sub-axillary umbel.

Species about 30, natives of Africa, tropical and sub-tropical America; 3 species found in South Africa, extending in the coastal districts from Clanwilliam to Port Alfred; also recorded from Somerset East.

6762

9. *PARAPODIUM*, E.Mey.

Calyx 5-partite. *Corolla* 5-lobed, with the lobes recurved or spreading at the tips. *Corona*-lobes 5, adnate to the corolla-tube in their lower part, free at the tips, quite free from the staminal-column. *Stamens* 5, united to the dilated part of the style to form a column; anthers with membranous appendages at the apex; pollen-masses solitary and pendulous in each anther-theca, attached by rather long caudicles to the pollen-carriers. *Follicles* large, coriaceous.

Erect herbs; leaves opposite; inflorescence an umbel, lateral at the nodes.

Endemic; species 3, found in a few of the central districts, on the Wittebergen Range and passing into the eastern O.F.S. and the Transvaal.

6777

10. *XYSMALOBium*, R.Br.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona*-lobes 5, arising from the staminal-column, variable in shape, very thick and fleshy, as thick as broad, or laterally compressed, or dorsally flattened, always solid, keelless or with one longitudinal median keel on the inner face, never cucullate nor complicate, nor with any filiform horn or long tongue-like process on the inner face. *Staminal-column* arising from the base of the corolla; anthers terminated by a membranous appendage; pollen-masses solitary and pendulous in each anther-theca, attached in pairs to the pollen-carriers by elongated caudicles. *Follicles* variable in shape, smooth, or more or less covered with soft bristle-like processes. *Seeds* crowned with a tuft of hairs.

Perennial herbs, with milky juice, with a tuberous rootstock or a cluster of thick fleshy fusiform roots; stems erect or decumbent, simple or branched at the base, sometimes solitary; leaves opposite; umbels few or many, lateral at the nodes, with 1 or 2 terminal, sessile or pedunculate, or solitary and terminal on a long peduncle.

An African genus of about 38 species; 16 species found in South Africa, mostly eastern, but fairly generally distributed; apparently absent from the southwestern districts north of Paarl.

6778

11. *SCHIZOGLOSSUM*, E.Mey.

Calyx 5-partite. *Corolla* deeply 5-lobed, often nearly to the base; lobes sometimes reflexed, rarely connate at the tips. *Corona* of 5 lobes from the staminal-column; lobes erect, dorsally flattened, usually thin, at least in dried flowers, rarely very thick and fleshy, never complicate, but sometimes with slightly infolded margins, often produced into a subulate or filiform point at the apex and furnished with 2 keels and often with 1 or 2 lobes or filiform points or teeth or other appendages on the inner face, rarely without keels or appendages. *Staminal-column* arising from the base of the corolla, united above with the dilated part of the style; anthers with membranous appendages which are erect or inflexed over the top of

the style. *Follicle* usually solitary by abortion, narrowly fusiform, beaked, smooth or covered with minute processes. *Seeds* crowned with a tuft of hairs.

Perennial herbs, with a tuberous rootstock, with erect, or rarely decumbent, usually slender stems; leaves opposite, alternate, or whorled, linear to elliptic, sometimes cordate or hastate at the base; inflorescence a pedunculate or sessile umbel, lateral at the nodes and terminal; flowers often small.

An African genus of about 120 species; 90 species in South Africa, chiefly massed in the eastern districts, Natal, and the Transvaal, but extend as far as Tulbagh in the south-western districts; rare in the central districts.

6779

12. FANNINIA, Harv.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona* of 5 lobes arising from the staminal-column; lobes linear-oblong, flat, with a distinct mid-rib and bearing 2 erect lobules at their base. *Stamens* connate in a tube round the ovary, with the anthers united to the style; anthers with a fringed membranous appendage; pollen-masses solitary and pendulous in each anther-theca, attached to the pollen-carriers by short abruptly curved caudicles which are broadly dilated at the basal half. *Fruit* not seen.

Herb, with a tuberous rootstock; leaves opposite; inflorescence a terminal umbel; flowers showy, white, with purple corona-lobes.

Endemic; species 1, extending from the Cathcart district to Natal.

6783

13. CORDYLOGYNE, E.Mey.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona* of 5 free lobes arising at the base of the staminal-column; lobes erect, spatulate-hastate, or linear-oblong, with a triangular tooth on each side at the middle, with two keels and a transverse ridge or flap on the inner face, without any processes alternating with them at the base. *Staminal-column* arising from the base of the corolla, cylindric, not contracted at the apex or base; anthers terminated by a membranous appendage; pollen-masses pendulous and solitary in each anther-theca, attached in pairs by slender caudicles to very minute pollen-carriers. *Follicles* narrowly fusiform. *Seeds* crowned by a tuft of hairs.

Perennial erect herbs; rootstock tuberous; leaves linear; inflorescence a long-peduncled globose umbel, solitary or 2 (rarely 3-4) to a stem.

Endemic; species 1, found in the Transvaal, Natal, Griqualand West, and some central districts.

6783a

14. PERIGLOSSUM, Decne.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona* of 5 lobes arising at the base of the staminal-column; lobes very shortly connate at the base, erect, spatulate-oblong, spatulate-sagittate, or linear-oblong, with a transverse ridge or flap and often 2-keeled on the inner face, with a long and distinct or minute and rudimentary slender filiform process alternating with them at the base. *Staminal-column* arising from the base of the corolla, sub-globose from being constricted at the apex and base; anthers terminated by a membranous appendage; pollen-masses solitary and pendulous in each anther-theca, attached in pairs to a very minute black horny pollen-carrier by rather stout caudicles which are doubly curved. *Fruit* not seen.

Perennial erect herbs, with solitary simple stems; rootstock a tuber; leaves linear; inflorescence a pedunculate globose 6 to many-flowered umbel, arranged 2-4 together racemously along the upper part of the stem.

Endemic; species 4, found in the Transvaal and Natal and as far south as Komgha.

6785

15. EUSTEGIA, R.Br.

Calyx 5-partite. *Corolla* very deeply 5-lobed. *Corona* of 3 series of erect lobes arising from the base of the staminal-column; outer series of 5 entire lobes opposite the corolla-lobes; middle series of 5 trifid or sub-simple lobes alternating with the corolla-lobes; inner series of 5 entire lobes also alternating with the corolla-lobes, pressed against the backs of the anthers. *Stamens* connate around the ovary; anthers adnate to the style-disc and tipped with short membranous appendages; pollen-masses solitary and pendulous in each anther-theca, laterally attached at their attenuated tips to the strongly hooked ends of the long caudicles. *Follicles* not seen.

Small tuberous-rooted perennials, branching at the ground level into many decumbent or ascending stems; leaves small, opposite, linear-filiform to linear-hastate; inflorescence in pedunculate umbels, lateral at the nodes; flowers small.

Endemic; species 5, extending from Namaqualand to the Cape.

6786.

16. EMICOCARPUS, K. Schum. & Schltr.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona* very complicated; outer arising in the angle between the corolla and the staminal-column, consisting of 20 segments; segments all very shortly connected at the base or almost free and apparently belonging to one series, but probably composed of 2 whorls, the outer consisting of 5 simple segments opposite the corolla-lobes, and the inner of 5 tripartite segments alternating with them, with their lateral lobes infolded so as to stand in front of the simple outer lobes, as if they were appendages arising from the base of it; inner corona of 5 simple lobes arising a short distance up the staminal-column near or at the base of the anthers and applied to their backs. *Stamens* arising at the base of the corolla, united into a tube around the ovary, with the anthers adnate at their base to the dilated part of the style, and tipped with a very minute scarcely visible appendage; pollen-masses solitary and pendulous in each anther-theca, very minute, attached in pairs by long abruptly bent caudicles to the pollen-carriers. *Carpels* with a single ovule in each ovary. *Follicles* small, ob-triangular, with 3 spreading spines at the top, probably indehiscent. *Seed* solitary, curved, sub-terete, without a tuft of hairs at either end.

A procumbent herb; leaves palmately divided; inflorescence a small pedunculate umbel, lateral at the nodes; flowers small.

Endemic; species 1, recorded from Delagoa Bay.

6787

17. KREBSIA, Harv.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base; lobes recurved at the tips. *Corona-lobes* 5, arising at or near the base of the staminal-column, exceeding the corolla, simple, erect, narrowly lanceolate, strongly keeled all down the back and more or less acutely triquetrous in transverse section, with a rhomboid wing-like dilation on the back at the base, tapering above into an acute incurved-hooked apex, without an appendage on the inner face. *Stamens* united into a cylindric column around and with the style; filamental part very short or almost none; anthers tipped with a membranous appendage; pollen-masses solitary and pendulous in each anther-theca, attached in pairs to the pollen-carriers by slender caudicles. *Follicles* not seen.

Perennial herbs, probably with a tuberous rootstock; leaves linear; inflorescence of very shortly pedunculate sub-globose umbels, lateral at the nodes.

Endemic; species 2, recorded from the Transvaal, Natal, the Transkei, Aliwal North, Queenstown, and near the Kat River.

6787a

18. PACHYCARPUS, E.Mey.

Calyx 5-partite. *Corolla* 5-lobed, with the lobes sometimes reflexed. *Corona* of 5 lobes arising at or near the base of the staminal-column; lobes usually long and flattened dorsally beneath or at least beyond the keels, never complicate-cucullate, very spreading, or spreading at the base, with erect or incurved tips, rarely wholly erect and then with reflexed sides and a single keel down the face, usually with a pair of contiguous often fleshy keels or a longitudinally fissured fleshy hump at the base and prolonged beyond into a linear lanceolate dilated or 3-lobed blade, occasionally reduced to the keels or hump only, rarely keeled to the apex or without keels. *Staminal-column* arising from the base of the corolla, often with the filament part undeveloped, very broadly conical from the anther-wings being very broad and projecting at the base, or pentagonally cylindric with them and less developed; anthers with terminal membranous appendages; pollen-masses solitary and pendulous in each anther-theca, attached in pairs to the pollen-carriers by well-developed caudicles. *Follicle* solitary (in all the specimens seen), coriaceous, stoutly fusiform or ovoid-fusiform, very obtuse, winged, at least on the upper part, sometimes toothed or echinate along the wings. *Seeds* crowned with a tuft of hairs.

Erect perennial herbs; rootstock probably tuberous or of thick fleshy roots; leaves opposite; inflorescence in pedunculate 2 to several-flowered umbels, lateral at the upper nodes and terminal, or flowers in pairs; flowers large or of moderate size.

An African genus of 27 species; 26 species in South Africa, found in the Transvaal, Natal, and the eastern districts; rare in the south-eastern and central districts; extend to Swellendam.

6790

19. WOODIA, Schltr.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base; lobes with revolute margins. *Corona*-lobes 5, arising from the base of the staminal-column, dorsally flattened, concave at the basal part, with the incurved margins ascending the staminal-column as narrow wings, deeply trifid, or quadrate with square shoulders and an incurved middle tooth, with one stout keel on or decurrent from the inner face of the middle tooth. *Stamens* arising from the base of the corolla; filaments connate into a tube round the ovary; anthers terminated by a membranous appendage; pollen-masses solitary and pendulous in each anther-theca, attached in pairs to pollen-carriers by rather stout caudicles. *Follicles*, where known, covered with short spine-like processes. *Seeds* crowned with a tuft of hairs.

Perennial herbs, probably with a tuberous rootstock; stem usually solitary, erect, simple or rarely with one branch; leaves opposite; umbels sessile or pedunculate, lateral at the nodes and terminal.

Endemic: species 3, extending from Humansdorp through the coastal districts into Natal and the Transvaal; also recorded from Somerset East and Queenstown.

6791

20. ASCLEPIAS, Linn.

Calyx 5-partite. *Corolla* 5-lobed usually nearly to the base, often reflexed. *Corona* of 5 lobes arising at or above the base of the staminal-column; lobes erect or radiately spreading, cucullate or compressed-cucullate, at least at the basal part, or with a fissure down the inner face, with or without a horn, tooth, flap, keel, or other process within the cavity. *Staminal-column* arising from the base of the corolla, united above with the dilated part of the style; anthers terminated by membranous or rarely sub-petaloid

appendages, which are erect or inflexed upon or over the top of the style ; pollen-masses solitary and pendulous in each anther-theca, attached in pairs by long or short caudicles to the pollen-carriers. *Follicle* solitary, or very rarely follicles in pairs, globose to narrowly fusiform, usually beaked, smooth, winged, or more or less covered with subulate processes or tubercles. *Seeds* crowned with a tuft of hairs.

Perennial herbs, often with a tuberous rootstock ; stems erect or decumbent, simple or branched ; leaves opposite or whorled, linear-filiform to elliptic, sometimes cordate or hastate at the base ; inflorescence of pedunculate or very rarely sessile umbels, lateral at the nodes, or terminal, or both ; flowers usually of moderate size.

Species about 150, distributed throughout Africa and the warmer parts of North and South America, with 2 species in Arabia and the Orient ; about 60 species in South Africa, found chiefly in the Transvaal, Natal, and the eastern districts ; rare north of the Cape in the coastal districts ; frequent in the central districts.

6810

21. PENTARRHINUM, E.Mey.

Calyx 5-partite. *Corolla* very deeply 5-lobed. *Corona* of 5 lobes arising from the base of the staminal-column ; lobes obconic, or trumpet-, or slipper-shaped, with infolded margins, forming a channel or a narrow funnel-shaped cavity within, truncate or rounded at the apex, with a horn directed forwards over or towards the anthers. *Stamens* arising from the base of the corolla, united into a tube around the ovary and style ; anthers with a terminal membranous appendage inflexed over the apex of the style ; pollen-masses pendulous and solitary in each anther-theca, attached to the pollen-carriers by slender caudicles. *Follicles* lanceolate, more or less beaked and more or less echinate. *Seeds* crowned with a tuft of hairs.

Perennial twining herbs, with slender stems ; leaves opposite, petiolate, cordate ; inflorescence in pedunculate umbel-like cymes, lateral at the nodes.

An African genus of 3 species ; 2 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district ; occasional in the central districts ; also recorded from S.W. Africa.

6834

22. CYNANCHUM, Linn.

Calyx 5-partite. *Corolla* very deeply 5-lobed. *Corona* arising from the staminal-column near or at its base, either annular, cup-shaped, or tubular, entire, toothed, or lobed at the top, or divided nearly or quite to the base into 5 entire or toothed lobes, with or without a tooth, lobe, thickening, or keels within the tube in front of each of the principal teeth or lobes, or on the inner face, or at the base of the lobes when the corona is divided. *Staminal-column* arising at or near the base of the corolla, constricted under the anthers into a short or long stipe (filament part) within the corona, or the anthers nearly or quite sessile without a stipe, tipped with membranous or slightly fleshy appendages, inflexed or connivent over the apex of the style or erect around it ; pollen-masses pendulous and solitary in each anther-theca, affixed in pairs by short or long caudicles to the pollen-carriers. *Follicles* sometimes winged or keeled, smooth or setose. *Seeds* crowned with a tuft of hairs.

Stem twining, erect, or decumbent, leafy, rarely apparently leafless and succulent ; leaves opposite ; inflorescence fasciculate, or in pedunculate simple umbel-like or compound and corymbose cymes, rarely in racemes, sub-axillary or lateral at the nodes.

Species 100, cosmopolitan ; 12 species in South Africa, fairly widely distributed.

6842

23. GLOSSOSTEPHANUS, E.Mey.

Calyx 5-partite. *Corolla* very deeply 5-lobed ; lobes sub-erect, linear. *Corona* of 5 simple lobes, arising from the base of the staminal-column ; lobes erect, laterally compressed and dorsally grooved. *Stamens* 5, united into a column around the ovary and adnate to the dilated part of the style ; anthers terminated by a minute membranous appendage ; pollen-masses pendulous, attached in pairs to the erect narrow pollen-carriers, which are dilated and somewhat crutch-like at the apex.

A perennial herb, with slender twining stems ; leaves linear ; inflorescence cymose or racemose, lateral at the nodes.

Endemic ; species 1, extending from the Malmesbury to the Uitenhage district.

6849

24. SARCOSTEMMA, R.Br.

Calyx 5-partite. *Corolla* 5-lobed nearly to the base. *Corona* double, arising from the filament part of the staminal-column ; outer corona annular or cup-shaped, pentagonal, truncate or shortly lobed ; inner corona of 5 erect fleshy compressed or keeled lobes, embraced at the base by the outer corona. *Staminal-column* arising from the base of the corolla ; anthers with terminal membranous appendages inflexed upon the apex of the style or ascending and surrounding it ; pollen-masses pendulous and solitary in each anther-theca, attached in pairs by short slender caudicles to the pollen-carriers.

Apparently leafless shrubs ; stems branching, terete, trailing or twining ; inflorescence a terminal sessile umbel, or lateral at the nodes.

Species few, found in the dry parts of the tropical and sub-tropical regions of the Old World ; 1 species in South Africa, and found in the Transvaal and Natal, then from Albany to Mossel Bay ; also recorded from the Graaff-Reinet and Van Rhynsdorp districts and Griqualand West.

6860

25. SECAMONE, R.Br.

Calyx 5-partite. *Corolla* 5-lobed to the middle or beyond ; lobes with fleshy sub-marginal ridges and often with a central ridge on their basal half, all decurrent on the tube within. *Corona* of 5 small or minute simple lobes, arising from and more or less adnate to the staminal-column. *Stamens* arising from the bottom of the corolla, united with the dilated part of the style, but scarcely connate with each other, or connate only at the very base ; anthers terminated by fimbriate membranous appendages which are sometimes connate ; pollen-masses 20. *Follicles* acuminate, smooth. *Seeds* crowned with a tuft of hairs.

Climbing shrubs ; leaves opposite, often pellucid-dotted ; flowers small, usually in 3 to many- (rarely 2-) flowered cymes, very rarely solitary ; cymes axillary and terminal.

Species many, natives of the hotter regions of the Old World ; 5 species in South Africa, extending from the Transvaal and Natal through the coastal districts to Clanwilliam ; also recorded from Somerset East.

6861

26. SISYRANTHUS, E.Mey.

Calyx 5-partite. *Corolla* 5-lobed to half-way ; tube either quite glabrous, but more often bearded with hairs at the mouth, or with 5 small tufts of hair in the throat ; lobes glabrous or with hairs on the inner face. *Corona* of 5 lobes arising from the staminal-column and partly adnate to it ; lobes

with their sides and upper part free, ovate, deltoid-ovate, or oblong, entire, obtuse or acute, or rhomboid or broadly cuneate and 3-toothed, with the lateral teeth very small and the middle tooth large, acute (rarely bifid), or prolonged into a subulate or filiform point, erect or the points incurved or connivent. *Stamens* arising from the base of the corolla, their filaments connate into a tube around the ovary and adnate to the top of the dilated part of the style; anthers without an apical appendage, but often ciliated with long hairs at the apex; pollen-masses solitary and erect in each anther-theca, attached in pairs to the pollen-carriers by short caudicles. *Follicles* rather slender, narrowly fusiform, tapering into a beak, smooth. *Seeds* crowned by a tuft of hairs.

Erect herbs; rootstock a cluster of long fleshy roots; stem rather slender, usually simple; leaves long, linear, in distant pairs, those of the lowest 2-4 nodes very much reduced or rudimentary and closely adpressed to the stem; inflorescence an umbel, lateral and pedunculate, or terminal and sub-sessile.

Endemic; species 11, extending from the Transvaal, Swaziland, and Natal into the eastern O.F.S. and Basutoland and then south as far as the Bathurst district; also recorded from the Queenstown district.

6862

27. ORTHANTHERA, Wight

Calyx 5-partite. *Corolla* 5-lobed; tube usually inflated at the base; lobes sometimes with minute pocket-like thickenings at the sinuses between them. *Corona* of 5 erect Λ -shaped lobes arising at or near the base of the staminal-column and adnate to it between the pairs of anther-wings, nearly or quite as long as the latter; lobes with free outstanding or reflexed wing-like (when dried) margins. *Staminal-column* arising from the base of the corolla-tube and enclosed in the inflated part; anthers with a subulate or narrow appendage or apiculus; pollen-masses solitary in each anther-theca, attached in pairs to the pollen-carriers by short slender caudicles at their base. *Follicles* terete and acute, or fusiform and acuminate, smooth. *Seeds* crowned with a tuft of hairs.

Herbaceous, with prostrate leafy stems, or shrubby with erect parallel branches; leaves apparently absent or linear, opposite; inflorescence in pedunculate or sub-sessile umbels or clusters, lateral at the nodes; flowers small or of moderate size.

Species 3, natives of Africa and India; 2 species in South Africa found in the Transvaal, the north-western districts, and S.W. Africa; both species also occur in tropical Africa.

6865

28. MACROPETALUM, Burch.

Calyx 5-partite. *Corolla* 5-lobed; tube exceedingly short; lobes 5, linear-filiform, reflexed straight back from their base. *Corona* small, of 5 simple lobes opposite the anthers, arising above the base of the staminal-column and adnate to it up to the base of the anthers, free above. *Staminal-column* arising from the base of the corolla, small, and together with the corona entirely exserted; anthers tipped with a membranous appendage; pollen-masses minute, erect, solitary in each anther-theca, attached in pairs to very minute pollen-carriers by short slender caudicles at their middle. *Follicles* erect, slightly diverging, slender, smooth. *Seeds* not seen.

A perennial herb, with a tuberous rootstock; stems slender, erect, simple or branched above; leaves opposite, filiform; inflorescence in fascicles of 2-4 flowers at the nodes.

Endemic; species 1, found in the Transvaal, the O.F.S., and Bechuanaland.

6868

29. ANISOTOMA, Fenzl

Calyx 5-partite. *Corolla* deeply 5-lobed. *Corona* arising near or at the base of the staminal-column, really double, but apparently of 5 dorsally flattened entire denticulate or bifid lobes opposite the anthers (really outer corona-lobes), with a long appendage (really inner corona-lobes) on their inner face. *Staminal-column* arising from the base of the corolla; anthers without an appendage, but with two or more hairs at their tips; pollen-masses erect, solitary in each anther-theca, attached in pairs to the pollen-carriers by very slender caudicles. *Fruit* not seen.

Perennial herbs; rootstock a cluster of thick fleshy roots; stems several, prostrate; leaves opposite, petiolate, cordate-ovate or cordate-orbicular; inflorescence in pedunculate or sessile umbel-like cymes; flowers rather small.

Endemic; species 2, found in Natal, and then from the Katberg to the Uitenhage district.

6870

30. BRACHYSTELMA, R.Br.

Calyx 5-partite. *Corolla* 5-lobed, the whole corolla sometimes reflexed from the base; lobes free or connate at the tips forming a sort of cage. *Corona* arising from the staminal-column, double, or falsely appearing 1-seriate; outer corona cupular and 5-10-toothed or -lobed, or divided by 5 cut-like fissures, or rarely entire, or of 5 minute pouches, or distinct entire or bifid lobes, alternating with the inner corona-lobes, or sometimes divided to the base and the 2 adjacent halves of 2 lobes connate and adnate to the sides or back of the base of the inner corona-lobes and falsely appearing to form part of or to stand behind them; inner corona of 5 lobes incumbent on the backs of the anthers and shorter to longer than them, often dorsally connected at the base to the outer corona or adnate to the sides of its lobes. *Staminal-column* arising from the base of the corolla; anthers without an apical appendage; pollen-masses horizontal or ascending, solitary in each anther-theca, attached in pairs by very short caudicles to the pollen-carrier, or sub-sessile. *Follicles* fusiform or linear-fusiform, smooth. *Seeds* crowned with a tuft of hairs.

Perennial herbs, usually of dwarf habit; rootstock a tuber or cluster of thick fleshy roots; stem solitary or 2 to several to a tuber, simple or branched, erect, prostrate, or rarely twining; leaves opposite; flowers small or of moderate size, solitary or 2 to many together, lateral at the nodes, or inflorescence a terminal umbel or umbel-like cyme.

Species about 60, natives of Africa and India; 44 species in South Africa, fairly widely distributed.

6874

31. CEROPEGIA, Linn.

Calyx 5-partite. *Corolla* 5-lobed; tube more or less inflated at the base; lobes free or connate at their tips into a canopy or cage-like top. *Corona* double, never 3-seriate; inner corona cup-shaped and entire, or 5-10-toothed, or of 5 bifid lobes often pouch-like at the base, or reduced to minute pouches, or the lobes divided to the base and the halves adnate to the adjacent sides of the inner corona-lobes, the whole corona then apparently formed of 1 series of 5 trifid lobes opposite the anthers, or the halves or teeth of 2 adjacent lobes connate and forming 5 lobes immediately behind the inner corona-lobes, which are shorter to longer than the anthers and incumbent upon them, at least at the base, dorsally adnate at their base to the outer corona. *Staminal-column* arising at or close to the base of the corolla, very short; anthers without an appendage; pollen-masses ascending or sub-horizontal, solitary in each anther-theca, attached in pairs by very short caudicles to the pollen-carriers, or sub-sessile upon them. *Follicle*

lanceolate, very narrowly fusiform or sub-terete, acutely acuminate, sometimes obtuse, smooth or rugose. *Seeds* crowned with a tuft of hairs.

Perennial herbs ; rootstock a tuber or cluster of thick fleshy roots, or rarely with ordinary stout root-fibres ; stems erect, twining, rambling, prostrate, or pendulous, herbaceous or fleshy ; leaves opposite, or rarely absent ; flowers of moderate size or large, of singular and varied forms, solitary or in pairs, or inflorescence umbel-like or rarely a raceme, lateral at the nodes, rarely terminal.

Species over 160, natives of Africa, the Mascarene Islands, the Malay Archipelago, and the hotter parts of Asia ; 38 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district ; also found in some central districts, Bechuanaland, and Griqualand West.

6875

32. RIOCREUXIA, Decne.

Calyx 5-partite. *Corolla* 5-lobed ; tube more or less inflated at the base ; lobes linear, connate at their tips. *Corona* 2-3- (rarely 1-) seriate, arising from the staminal-column ; outer corona-lobes 5, alternating with the anthers, either minute, bifid or deeply divided, or conspicuous and radiating, filiform, subulate, narrowly deltoid, ovate or sub-rectangular, free or connate at the base, with or without a series of 5 pairs of teeth alternating with them at their base ; inner corona-lobes 5, linear or subulate and usually equalling or exceeding the anthers and incurved over them, or shortly linear-oblong or minute and not reaching beyond the base of the anthers, rarely obsolete. *Staminal-column* arising from or near the bottom of the corolla, very short, and together with the corona included in the inflated part of the corolla ; anthers tipped with a minute somewhat fleshy appendage or apiculus ; pollen-masses erect, solitary in each anther-theca, attached below their middle by exceedingly short caudicles to the pollen-carriers. *Follicles* linear-terete or linear-fusiform, acuminate, more or less beaded from constrictions between the seeds, smooth. *Seeds* crowned with a tuft of hairs.

Perennials, with tuberous roots and annual twining stems ; leaves opposite, cordate ; inflorescence a laxly branching cyme, or flowers in fascicles at the 2-3 nodes of simple peduncle-like flowering axes (which are bent at the nodes), with or without another fascicle at their base, or all compactly fasciculate at the nodes of the stem.

An African genus of 8 species ; 6 species in South Africa, extending from the Transvaal and Natal to the George district ; also found in Griqualand West, the O.F.S., and the Aliwal North and Queenstown districts.

6878

33. HOODIA, Sweet

Calyx 5-partite. *Corolla* large, flat, concave, or cup-shaped, with a very small proper tube, just enclosing the corona ; limb obsoletely or but slightly 5-lobed ; lobes abruptly terminated by a subulate point. *Corona* double, arising from the staminal-column ; outer corona of 5 concave spreading lobes, emarginate or bifid at the apex ; inner corona of 5 linear lobes incumbent upon the backs of the anthers, dorsally connected to the outer corona by 5 short partitions. *Staminal-column* arising from near the base of the small corolla-tube ; anthers without an apical appendage. *Follicles* elongated, terete-fusiform, solitary or in pairs, divaricate, smooth.

Stout succulent perennials, bushily branched, leafless ; stems very thick, cylindric, with many tuberculate angles ; tubercles spine- or bristle-toothed ; flowers large and showy, in small clusters of 2-5 or sometimes solitary, arising from the grooves between the angles of the stem towards or at the top, developing successively.

An African genus of 10 species ; 7 species in South Africa, found in S.W. Africa, Namaqualand, and the north-western and central districts ; absent from the Transvaal and the coastal districts.

6879

34. TRICHOCAULON, N.E.Br.

Calyx 5-partite. *Corolla* with a short tube, or the united part flattish or saucer-shaped, rarely with a raised ring on the disc, 5-lobed. *Corona* double, or sometimes the outer and inner corona apparently belonging to one series of 5 shortly 3-lobed segments opposite the anthers; outer corona of 5 bipartite or bifid or emarginate lobes, with straight or divergent-arcuate segments; inner corona-lobes incumbent on the backs of the anthers and sometimes produced beyond them, dorsally connected at the base with the outer corona and sometimes produced into a short tooth there. *Staminal-column* arising from the bottom of the corolla, short; anthers without appendages; pollen-masses ascending or sub-horizontal, solitary in each anther-theca, attached in pairs to the pollen-carriers by very short caudicles. *Follicles* fusiform, smooth. *Seeds* crowned with a tuft of hairs.

Succulent perennials, with thick cylindric leafless stems, having many vertical series of conical tubercles, tipped with a spine or a stout stiff bristle, or with crowded irregularly or spirally arranged short rounded pointless tubercles; flowers rather small, arising between the tubercles, at or towards the top or all over the stems, sub-solitary, or 2 or more together successively developed.

An African genus of 11 species; 11 species in South Africa, found in Namaqualand, the north-western and central districts; absent from the Transvaal and the coastal districts.

6880

35. TAVARESIA, Welw.

Calyx 5-partite. *Corolla* large, tubular-funnel-shaped, 5-lobed; the sinuses between the lobes forming acute projecting angles. *Corona* double, arising from the staminal-column; outer corona shortly tubular at the base, then divided into 10 long filiform segments; each segment terminated by a knob, and usually with a minute tooth between the pairs of segments that alternate with the anthers; inner corona of 5 narrow lobes incumbent upon the backs of the anthers and dorsally connected with the basal part of the outer corona by short partitions. *Staminal-column* arising from the base of the corolla; anthers without apical appendages; pollen-masses horizontal, solitary in each anther-theca, attached in pairs by short caudicles to subulate lateral processes from the pollen-carriers. *Follicles* not seen, but stated to be produced in pairs, somewhat diverging, narrowly lanceolate-fusiform, smooth. *Seeds* rather small, crowned with a tuft of hairs.

Leafless succulent perennials, branching at the base; stems erect or ascending, 6-12-angled; angles tuberculate-toothed, each tubercle furnished with 3 bristles; flowers 1-4 together at the base of the young stems, successively developed.

An African genus of 2 species; 1 species in South Africa, found in Namaqualand, the north-western and central districts.

6881

36. PIARANTHUS, R.Br.

Calyx 5-partite. *Corolla* usually deeply 5-lobed and rotate when fully expanded, rarely with a campanulate or cup-shaped tube, velvety or pubescent (rarely glabrous) on the inner surface. *Corona* arising from the staminal-column, simple, of 5 lobes incumbent upon the anthers; lobes with or without erect tips, or rarely erect, dorsally produced, or expanded into a truncate minutely tuberculate or denticulate crest. *Staminal-column* arising from the base of the corolla, short; anthers without apical appendages; pollen-masses sub-horizontal and solitary in each anther-theca, attached in pairs by very short caudicles to minute excrescences on the sides of the narrow pollen-carriers. *Follicles* and *seeds* not seen.

Very dwarf succulent leafless herbs, with watery juice ; stems decumbent or ascending ; flowers in pairs or fascicles, erect, small or of moderate size, at the apex or middle of the stems.

Endemic ; species 11, found in Namaqualand, the north-western and central districts ; absent from the coastal districts, Natal, and the Transvaal.

6882

37. HUERNIOPSIS, N.E.Br.

Calyx 5-partite. *Corolla* 5-lobed ; tube without small teeth at the sinuses between the lobes. *Corona* of 5 simple lobes arising from the staminal-column and adnate to it at their basal half, free above ; no outer corona. *Stamens* with the filaments connate into a tube around the ovary and adnate at the top to the dilated part of the style ; anthers with truncate apices ; pollen-masses solitary in each anther-theca, erect or ascending, attached in pairs by very short lateral caudicles to lateral processes of the pollen-carriers. *Fruit* not seen.

A dwarf herb, with stout succulent 4-5-angled stems, flowering at the base, middle, or towards the top ; flowers of moderate size.

Endemic ; species 1, found in S.W. Africa.

6883

38. DUVALIA, Haw.

Calyx 5-partite. *Corolla* deeply 5-lobed, with the disc raised into a cushion-like ring (*annulus*) around and supporting the outer corona ; margin of disc reflexed ; lobes narrowly linear-lanceolate to ovate, folded longitudinally backwards into vertical plates, or the basal half more or less expanded. *Corona* double, arising near the top of the staminal-column, stipitate ; outer corona flat, entire, more or less pentagonal, rarely 10-angled, resting on the rim of or on the sides of the cup formed by the annulus ; inner corona-lobes turgid, ovoid, more or less pointed at each end, sub-horizontal, with the dorsal point usually somewhat raised and the inner closely incumbent on the backs of the anthers and sometimes longer than them, but not produced into erect points. *Stamens* arising at the base of the corolla, united into a tube around the ovary and adnate to the dilated part of the style ; anthers without a terminal appendage ; pollen-masses horizontal or ascending, solitary in each anther-theca, attached by very short broad caudicles to lateral wing-like expansions of the pollen-carriers. *Follicles* erect, smooth. *Seed* with a tuft of hairs at one end.

Succulent leafless herbs of very dwarf habit ; stems decumbent or erect, in many of the species occasionally subterranean with the tips rising to the surface, 4-6-angled, with spreading teeth ; each tooth tipped with a minute deltoid-ovate or subulate acute rudimentary leaf, having a minute denticle (*stipule*) on each side of the base ; flowers in small clusters or cymes near the base or middle of the young shoots, sometimes solitary.

Species about 16, natives of Africa ; 1 species in Arabia ; 14 species in South Africa, found in Namaqualand and the central districts ; recorded from the Albany, Robertson and Riversdale districts, otherwise absent from the coastal districts, Natal and the Transvaal.

6884

39. CARALLUMA, R.Br.

Calyx 5-partite. *Corolla* 5-lobed, with a small or very rarely large campanulate or saucer-shaped tube, or rarely without a distinct tube and the united part nearly flat and disc-like. *Corona* usually distinctly 2-seriate ; outer series of 5 distinct entire or bifid lobes, or united into an entire or 5-15-toothed cup ; inner series of 5 filiform subulate linear-oblong subquadrate or hemispheric lobes, shorter to much longer than the anthers, and often dorsally connected to the outer series ; sometimes both series combined so as to appear falsely 1-seriate. *Stamens* with their filaments

connate into a tube round the ovary and adnate to the dilated style apex ; pollen-masses ascending or sub-horizontal and solitary in each anther-theca, attached in pairs by short slender caudicles to the pollen-carriers or to wing-like expansions of them.

Dwarf succulent leafless herbs, with stout 4-6- (very rarely 3-) angled stems and branches, toothed or toothless along the angles ; flowers variable, usually in fascicles, rarely solitary, near or at the base, or along the grooves between the angles, in a few specimens racemose along the attenuated terminal part of the stems.

Species about 80, natives of Africa, South Europe, Socotra, Arabia, and India ; 23 species in South Africa, found in the central, south-eastern, and south-western districts, Namaqualand, and S.W. Africa ; absent from the eastern districts ; rare in the Transvaal.

6885

40. STAPELIA, Linn.

Calyx 5-partite. *Corolla* rotate, or broadly cup-shaped, or with a short broad cup- or funnel-like tube, or with a central cavity containing the corona, with or without a raised ring (*annulus*) on the disc around the corona, 5-lobed. *Corona* double, arising from the staminal-column ; outer corona of 5 simple entire bifid 3-toothed or deeply 3-fid lobes alternating with the anthers, quite free, or rarely shortly connected at the base, very rarely of 10-15 free segments or sub-equally 10-toothed ; inner corona of 5 simple bifid 2-horned or dorsally winged or crested lobes opposite and incumbent at their base (or wholly) upon the anthers and longer or shorter than them. *Staminal-column* arising from the bottom of the corolla ; anthers without a terminal appendage ; pollen-masses ascending or sub-horizontal, solitary in each anther-theca, attached in pairs to the pollen-carriers by short stout caudicles ; pollen-carriers with a wing-like expansion on each side. *Follicles* narrowly or stoutly fusiform, smooth. *Seeds* crowned with a tuft of hairs.

Dwarf succulent perennial herbs, branching at the base ; stems thick and fleshy, 4- (rarely, and then abnormally, 5-6-) angled ; angles often compressed and usually toothed ; teeth spreading or ascending, or tipped with minute rudimentary (rarely with distinct) subulate leaves $\frac{1}{4}$ to less than $\frac{1}{2}$ inch long ; flowers 1 to many together from near the base, middle, or upper part of the stem, or the clusters scattered along their sides, pedicellate, large or of moderate size, rarely small, usually with a carrion-like or disagreeable odour.

An African genus of about 80 species ; 73 species in South Africa, widely spread. Many hybrids have been raised in gardens.

6887

41. HUERNIA, R.Br.

Calyx 5-partite. *Corolla* wholly campanulate, or with a short tube more or less constricted at its mouth and a very abruptly or horizontally spreading limb, 5-lobed, with 5 small teeth alternating with the lobes, formed by the projecting sinuses (in one species with the teeth and lobes of nearly equal size) ; both small and tooth-like, smooth, papillate or beset with simple or clavate hairs or processes on the inner face. *Corona* double (single in one species) ; outer corona spreading upon and more or less adnate to the bottom of the corolla-tube, disc-like and 5- or 10- crenate or -toothed, or the disc with 5 distinct lobes, or the lobes free to the base, bifid, emarginate, or rarely entire ; inner corona arising from the upper part of the staminal-column, of 5 simple lobes incumbent on the backs of the anthers and equalling or exceeding them, subulate, or clavate, or thickened at the apex, often with a slight transverse dorsal ridge at their base, but no crest wing or dorsal horn ; pollen-masses sub-horizontal, solitary in each anther-theca, attached in pairs by short triangular caudicles to lateral wing-like expansions of the pollen-carrier. *Fruits* not seen.

Perennial succulent dwarf plants ; stems leafless, angular, simple, toothed or sometimes with bristle-pointed teeth along the angles, glabrous ; flowers solitary, or in small culsters near the base or middle of the young stems, of moderate size.

Species over 30, natives of Africa ; 1 species in Arabia ; 24 species in South Africa, mostly found in the central districts, but recorded from the Transvaal, Natal, the Albany and Mossel Bay districts, and from the north-western districts.

6888

42. DIPLOCYATHA, N.E.Br.

Calyx 5-partite. *Corolla-tube* campanulate, with another tube arising from its base within and reaching to the mouth, and there thickened into a recurved rim. *Corona* double, arising from the staminal-column ; outer corona of 5 broad bifid lobes connate at the base ; inner of 5 ovate lobes incumbent on the backs of the anthers, and dorsally adnate to the base of the outer corona. *Stamens* with their filaments connate into a tube around the ovary, and adnate above to the dilated top of the style ; anthers with a truncate apex ; pollen-masses sub-horizontal, solitary in each anther-theca, attached in pairs by exceedingly short broad caudicles to (or sub-sessile upon) the rather large lateral wings of the pollen-carriers.

A dwarf succulent leafless perennial ; stems decumbent, stout, 4-angled, acutely toothed ; flowers large, pedicellate, arising from near the base of the young shoots.

Endemic ; species 1, found in the Calvinia, Ceres, Beaufort West, and Prince Albert districts.

6889

43. PECTINARIA, Haw.

Calyx 5-partite. *Corolla* small, 5-lobed ; lobes connate at the apex. *Corona* double ; outer corona cup-like and variably cut into 10 to numerous teeth, or of 5 minute lobes ; inner corona of 5 lobes incumbent upon the backs of the anthers, or erect and about equalling them, or longer and connivent-erect over them. *Stamens* with the filaments connate into a tube around the ovary and adnate to the dilated top of the style ; anthers without appendages ; pollen-masses solitary in each anther-theca, attached in pairs to the very minute brown pollen-carriers by very short caudicles. *Follicles* narrowly fusiform, acuminate, smooth, glabrous.

Succulent leafless herbs ; stems tufted, usually procumbent and often with their tips or other portions buried in the ground, in one species sometimes (always ?) flowering underground, acutely, obtusely, or obscurely 4-8-angled, acutely toothed, or tessellately tuberculate along the angles, often with a distinct bud in the axil of each tooth or tubercle when the stems are fully developed ; flowers small, solitary, or in fascicles in the grooves or on the sides between the angles, bud-like, often with a "frosted" appearance on the inner surface and sometimes outside as well.

Endemic ; species 5, found in Namaqualand, and a few in the north-western and central districts.

6890

44. RHYSSOLOBIUM, E.Mey.

Calyx 5-partite. *Corolla* somewhat fleshy, 5-lobed, densely bearded within. *Corona* none. *Stamens* united into a short column, inserted near the base of the corolla-tube ; the filament part with prominent horny margins on the upper part ; anthers terminated by a membranous appendage ; pollen-masses erect, attached in pairs by short caudicles to the elongated erect pollen-carriers. *Follicles* small, evidently thick and fleshy. *Seeds* not seen.

A small, much-branched shrublet, with woody whitish-puberulous branches ; leaves opposite or, at the base of the branchlets, sub-fasciculate, small and thick, sub-terete from the revolute margins ; flowers 1-3 together, sub-sessile at the nodes, very small.

Endemic ; species 1, found in Namaqualand.

6891

45. GYMNEMA, R.Br.

Calyx 5-partite. *Corolla* 5-lobed to the middle or beyond. *Corona* arising from and adnate to the corolla-tube, either of 5 fleshy lobes adnate up to the mouth of the corolla-tube, with more or less incurved tips, or of 5 pairs of fleshy ridges on the lower part of the tube, alternating with the corolla-lobes, densely ciliate (always?). *Staminal-column* arising from the base of the corolla; anthers with short membranous appendages; pollen-masses erect and solitary in each anther-theca. *Follicles* smooth. *Seeds* crowned with a tuft of hairs.

Twining shrubs; leaves opposite; inflorescence a lateral or sub-axillary umbel, often 2 from the same node and opposite; flowers small.

Species several, natives of the tropical and sub-tropical regions of the Old World: 1 species found in the Transvaal and Natal.

6896

46. SPHAEROCODON, Benth.

Calyx 5-partite. *Corolla* lobed to about half way down. *Corona* of 5 small fleshy tubercles arising from the staminal-column some distance above its base. *Staminal-column* arising from the base of the corolla; anthers without appendages; pollen-masses solitary and erect in each anther-theca, united in pairs to minute pollen-carriers by very slender caudicles. *Fruit* unknown.

Perennial herbs, with a woody or tuberous rootstock; stems erect, often flexuose, but not twining; leaves opposite; inflorescence a pedunculate sub-lateral umbel-like cyme.

An African genus of 2 species; 1 species in South Africa, found in the Transvaal, Swaziland, and Natal.

6899

47. TYLOPHORA, R.Br.

Calyx 5-partite. *Corolla* lobed very deeply or nearly to the base. *Corona* usually of 5 tubercles adnate to or radiating from the staminal-column at or above its base and usually not exceeding the filament part of it, rarely with free tips or of entirely free flat lobes and attaining to the level of the anther-tips. *Staminal-column* arising from the base of the corolla; anthers tipped with a small membranous appendage which is sometimes reduced to a mere hyaline margin; pollen-masses sub-erect, horizontal, or pendulous, attached in pairs to the minute pollen-carriers by very slender caudicles. *Follicles* usually narrowly lanceolate or lanceolate-fusiform, smooth, sometimes winged. *Seeds* crowned with a tuft of hairs.

Twining or rarely erect perennials; leaves opposite, petiolate; inflorescence consisting of a single pedunculate or sessile umbel-like cyme, or flower-cluster scattered along a single-jointed axis, or along the branches of a dichotomously branched cyme or panicle, lateral at the nodes or axillary.

Species many, natives of the tropical and sub-tropical regions of the Old World; 9 species in South Africa, extending from the Transvaal and Natal to George; also recorded from Somerset East and S.W. Africa.

6899a

48. EMPLECTANTHUS, N.E.Br.

Calyx 5-partite. *Corolla* deeply 5-lobed, the united part forming a broad shallow cupular tube. *Corona* double, arising from the staminal-column; outer corona 5-lobed; lobes small, pouch-like, spreading, alternating with the anthers; inner corona of 5 simple lobes, more or less adnate to the stamens, with free tips, and dorsally connected with the base of the outer corona-lobes. *Stamens* united into a tube around the ovary and adnate to the enlarged part of the style; anthers without any membranous appendages;

pollen-masses erect and solitary in each anther-theca, attached to the exceedingly minute pollen-carriers by extremely short caudicles. *Follicles* only seen in an immature state, long and slender, linear-terete, perhaps slightly constricted between the seeds when ripe.

Herbaceous twiners, with the habit and general appearance of *Tylophora*; leaves opposite, long-petioled, cordate; peduncles lateral at the nodes, bearing 1 or more fascicles of flowers.

Endemic; species 2, recorded from Zululand and Natal.

6911

49. MARSDENIA, R.Br.

Calyx 5-partite. *Corolla* campanulate, 5-lobed. *Corona* of 5 fleshy lobes arising from and adnate to the staminal-column, with free tips and often with free margins, sometimes with tubercle-like projections at the base which are sometimes confluent, producing more or less the appearance of an outer corona; tips erect or somewhat connivent, applied to the backs of the anthers. *Staminal-column* arising from or near the base of the corolla; anthers terminated by membranous appendages, which are free or connate and more or less incumbent on the top of the style-apex, or applied to the sides of its conical tip or beak; pollen-masses erect and solitary in each anther-theca, attached in pairs to the pollen-carriers by short or elongated moderately stout caudicles. *Follicles* with a thick or coriaceous pericarp, smooth, often winged. *Seeds* crowned with a tuft of hairs.

Climbing or erect perennials; leaves opposite; inflorescence an umbel-like cyme, or of small sessile umbels or clusters scattered along the branches of the cymes or panicles, which are lateral at the nodes or axillary.

Species many, natives of tropical and sub-tropical regions; 1 species in South Africa, ranging from Natal to the Uitenhage district; also recorded from the Cradock district.

6917

50. PERGULARIA, Linn.

Calyx 5-partite. *Corolla-tube* campanulate or cylindric; lobes 5, widely spreading. *Corona* double; outer corona arising at the base of the staminal-column, membranous, annular, shortly 5-lobed; inner corona of 5 erect fleshy lobes, adnate to the staminal-column up to the anthers, free above and produced into subulate horns incurved over the staminal-column, and at the base produced into spreading or deflexed spurs. *Staminal-column* arising at the mouth of the corolla-tube, entirely exerted; anthers terminated by a membranous appendage inflexed over the apex of the style; pollen-masses solitary and pendulous in each theca, attached in pairs to the pollen-carriers by their tapering ends, without caudicles. *Follicles* lanceolate, smooth or echinate. *Seeds* crowned with a tuft of hairs.

Perennial twining plants; leaves opposite, cordate; inflorescence a long-peduncled corymb or raceme, sub-lateral at the nodes; flowers of moderate size.

Species 4, natives of Africa, Arabia, Syria, India, and Madagascar; 2 species in South Africa, found in the Transvaal and Natal, S.W. Africa, Namaqualand, and Bechuanaland.

6917a

51. TELOSMA, Coville

Calyx 5-partite. *Corolla* 5-lobed; tube inflated at the base; lobes horizontally spreading. *Corona* of 5 erect lobes arising from the base of the staminal-column and adnate to it at their lower part, free above, with a narrow subulate process on their inner face. *Staminal-column* arising from the base of the corolla, with long erect membranous appendages, connivent over the style-apex; pollen-masses erect and solitary in each anther-theca, attached in pairs to the pollen-carriers by very short caudicles. *Follicles* smooth. *Seeds* crowned with a tuft of hairs.

Stems twining ; leaves opposite ; inflorescence in pedunculate or sub-sessile umbel-like cymes, sub-axillary or lateral at the nodes.

Species several, natives of Africa, India, and the Malay Archipelago ; 1 species in South Africa, found in Natal.

6921

52. TENARIS, E.Mey.

Calyx 5-partite. *Corolla* 5-lobed ; tube very short ; lobes linear, linear-spathulate, or filiform. *Corona* small, double, arising from the staminal-column above its base ; outer corona of 5 small concave lobes or minute pouches, more or less spreading, alternating with the anthers ; inner corona of 5 linear subulate or filiform lobes, incumbent on the backs of the anthers and shorter than, equalling, or exceeding the latter. *Staminal-column* arising from the base of the corolla, very small, included in the corolla-tube ; anthers without an appendage, or rarely with a very short one ; pollen-masses minute, sub-ascending or sub-horizontal, solitary in each anther-theca, attached in pairs to the pollen-carriers by very short slender caudicles. *Follicles* erect, somewhat diverging, slender, smooth. *Seeds* crowned with a tuft of hairs.

Perennial herbs, with a tuberous rootstock ; stems slender ; leaves opposite, linear or filiform ; inflorescence leafless and terminal, racemose or paniculate, or the flowers 1-3 together in sessile or pedunculate fascicles, or in long slender racemes, lateral at the nodes of the terminal and leaf-bearing part of the stem.

An African genus of 7 species ; 4 species in South Africa, found in the Transvaal and then in the Uitenhage, Bathurst, and Albany districts.

6924

53. FOCKEA, Endl.

Calyx 5-partite. *Corolla* 5-lobed ; tube very short. *Corona* arising near the mouth or towards the base of the tube at the insertion of the staminal-column, and longer than the former, tubular, toothed at the top, and with 1-3 superposed series of 5 teeth or filiform processes placed between, or decurrent as 5 pairs of wings within the tube. *Staminal-column* inserted near the mouth or towards the base of the corolla-tube ; anthers with very large erect membranous appendages ; pollen-masses erect and solitary in each anther-theca, sessile in pairs at the apex of minute pollen-carriers. *Follicles* not echinate. *Seeds* crowned with a tuft of hairs.

Perennials, with a large tuberous rootstock and twining or erect stems ; leaves opposite ; inflorescence of small sub-axillary clusters or cymes.

An African genus of 11 species ; 5 species in South Africa, recorded from the Transvaal, Natal, Griqualand West, and the Beaufort West, Mossel Bay, and Uitenhage districts.

157. CONVULVULACEÆ.

Flowers regular, rarely slightly irregular, usually bisexual. *Calyx* 5-(rarely 4-) partite to the base, persistent, imbricate. *Corolla* 5-lobed or 5-cleft, rarely 4-lobed ; tube usually 5-angled, campanulate or funnel-shaped, rarely almost rotate, plicate in bud. *Stamens* as many as and alternating with the corolla-lobes, inserted on the corolla-tube ; anthers 2-theous ; dehiscing longitudinally. *Ovary* superior, entire or sometimes deeply lobed, often surrounded by a disc, 1-4-chambered, with 1-4 erect ovules in each chamber ; styles 1-2, sometimes 2-cleft ; stigmas capitate, dilated, or linear. *Fruit* capsular or indehiscent. *Seeds* as many as the ovules or fewer, glabrous, villous, or woolly, with folded cotyledons ; endosperm present.

Herbs or shrubs, frequently twining, rarely trees (in *Cuscuta* leafless parasites); leaves alternate, simple, sometimes dissected, exstipulate, rarely stipulate; inflorescence a pedunculate bracteate axillary cyme, or flowers solitary; flower various in size and colour, often showy.

Tribe **Cuscutæ**: Corolla-lobes small, imbricated; ovary 1-2-chambered, with 4 ovules; leafless twining stem parasites, with pale yellowish stems (genus 1).

Tribe **Dichondræ**: Corolla plicate or induplicate in aestivation; ovary 2-4-lobed, with 4 ovules; style basal; fruit of 2 or 4 small utricles, or solitary by abortion; prostrate or creeping herbs (genera 2-3).

Tribe **Convolvulæ**: Corolla plicate or induplicate in aestivation; ovary entire, usually 2-chambered, more rarely 1- or 3-chambered, with 2 (rarely 1) ovules in each chamber; style simple, or styles 2 (genera 4-12).

1. Plants pale yellowish; a herbaceous twining parasite; leaves reduced to scales or wanting 1. *Cuscuta*, Linn.
Plants green 2
2. Ovary and fruit 2- or 4-lobed; styles 2, inserted between the lobes of the ovary 3
Ovary and fruit entire; style 1, 2-cleft, rarely styles 2, but then terminal 4
3. Ovary 4-lobed, with a single ovule in each lobe . . . 3. *Falkia*, Linn. f.
Ovary 2-lobed, with 2 ovules in each lobe . . . 2. *Dichondra*, Forst.
4. Ovary 1-chambered 5
Ovary usually 2-chambered, rarely 3-4-chambered 6
5. Sepals unequal; corolla bell-shaped, entire; leaves ovate-cordate; bracts small 9. *Hewittia*, Wight & Arn.
Sepals about equal; corolla slightly lobed; leaves sagittate or hastate; bracts large, leaf-like 8. *Calystegia*, R.Br.
6. Styles 2, free, or united below 7
Style 1; stigma usually simple, sometimes 2 8
7. Stigmas filiform or club-shaped 4. *Evolvulus*, Linn.
Stigmas capitate or peltate 5. *Seddera*, Hochst.
8. Stigma linear, filiform, or oblong 9
Stigma elliptic, disciform, globose, or capitate 10
9. Plants covered with star-shaped hairs 10. *Astrochlaena*, Hallier
Plants glabrous, if hairy then hairs not star-shaped 7. *Convolvulus*, Linn.
10. Stamens much exserted 12. *Quamoclit*, Tourn.
Stamens inserted low down in the corolla-tube, included 11
11. Stigmas capitate or sub-globose 11. *Ipomœa*, Linn.
Stigmas flattened, ovate 6. *Jacquemontia*, Choisy

6968

1. CUSCUTA, Linn.

Sepals distinctly sub-equal, united at the base into a short campanulate 5-lobed (rarely 4-lobed) tube. *Corolla* campanulate, ovoid, or globose; lobes 5, rarely 4, imbricate. *Stamens* fixed in the corolla-throat or just below the throat, with a membranous scale below each of them arising from low down in the tube. *Ovary* completely or partially 2-chambered, with 4 ovules; styles 2, free, or connate at the base; stigmas clavate or capitate. *Fruit* a globose or ovoid dry or fleshy capsule, circumscissile or irregularly dehiscent. *Seeds* glabrous.

Leafless parasites, with filiform twining stems and whitish or rose-coloured flowers.

Species about 80, distributed in the warmer and temperate regions; about 12 species in South Africa, found in the Transvaal, Natal, and in the coastal districts to the Cape; also recorded from Griqualand West and the Graaff-Reinet and Somerset East districts.

6971

2. *DICHONDRA*, Forst.

Sepals sub-equal, distinct from the base, usually spatulate. *Corolla* broadly campanulate, deeply 5-fid; lobes induplicate. *Stamens* shorter than the corolla. *Ovary* completely 2-lobed, with 2 ovules in each chamber; styles 2, free, attached between the lobes; stigmas capitate. *Fruit* of 2 membranous capsules, indehiscent or irregularly 2-valved. *Seeds* 1, rarely 2, in each capsule, sub-globose.

Small prostrate glabrous or silky-pubescent herbs; leaves cordate-orbicular or reniform, usually small; flowers solitary, axillary, small.

Species 4-5 found in the warmer regions of both hemispheres; 1 species in South Africa, recorded from Natal to the Cape; fairly generally distributed in the southern coastal districts.

6972

3. *FALKIA*, Linn.

Sepals 5, sub-equal, broad, leafy, accrescent, joined at the very base. *Corolla* 5, broadly funnel-shaped or campanulate; limb plicate, 5-angled, or shortly and broadly 5-lobed. *Stamens* 5, inserted low down in the corolla-tube, included. *Ovary* deeply 4-lobed, with a single ovule in each chamber; styles 2, gynobasic; stigmas capitate. *Fruit* split into 4 membranous utricles, or fewer by abortion. *Seeds* obovoid or sub-globose.

Dwarf prostrate matted perennial herbs; leaves small, entire, petioled; flowers small, peduncled, in the axils of the leaves.

Species 3, all in South Africa, found in the coastal belt from the Transvaal and Natal to the south-western districts; also in the O.F.S. and Griqualand West; 1 species extends into tropical Africa.

6973

4. *EVOLVULUS*, Linn.

Sepals 5, various in shape, sub-equal. *Corolla* funnel-shaped, campanulate or sub-rotate; limb plicate, 5-angled, or shortly 5-lobed. *Stamens* 5, fixed above the middle of the corolla-tube, rarely near the base, included or exserted. *Ovary* 2-chambered, rarely 1-chambered by the abortion of the septum, with 2 ovules in each chamber; styles 2, distinct from the base and each divided above; stigmas linear-terete or sub-clavate. *Fruit* a sub-globose capsule, dehiscing into 2-4 valves. *Seeds* 4, or by abortion fewer, glabrous.

Annual or perennial herbs, not twining, rarely undershrubs; leaves usually small and quite entire; bracts minute; inflorescence sometimes a terminal spike, or raceme, or a lax panicle, more usually flowers solitary and sub-sessile, or 1-3-nate on axillary peduncles.

Species about 70, chiefly natives of tropical America; 1 species in South Africa, extending from the Transvaal into Natal, Bechuanaland, and Griqualand West.

6978

5. *SEDDERA*, Hochst.

(*Breweria*, R. Br.)

Sepals 5, sub-equal, or the outer larger than the inner. *Corolla* funnel-shaped, plicate, 5-angled, shortly and broadly lobed. *Stamens* 5, shorter than the corolla; filaments usually dilated at the base and usually toothed on each side. *Ovary* 2-chambered, with 2 ovules in each chamber; styles more or less deeply bifid; stigmas capitate. *Fruit* a capsule, dehiscing into 4 valves. *Seeds* glabrous or pilose.

Erect or scandent; leaves entire; inflorescence an axillary cyme, sometimes a terminal thyrsoid panicle, sometimes reduced to a single flower.

Species about 25, distributed through the warmer regions of both hemispheres; 2 species in South Africa, extending from the Transvaal into Natal, Bechuanaland, and Griqualand West; also recorded from the Queenstown district.

6991

6. JACQUEMONTIA, Choisy

Sepals 5, leafy, equal, or the outer larger than the inner. *Corolla* broadly or narrowly campanulate; limb plicate, 5-angled or obscurely 5-lobed. *Stamens* inserted near the base of the corolla, included. *Ovary* 2-chambered, with 2 ovules in each chamber; stigmas 2, ovate or oblong, more or less flattened. *Fruit* a globose capsule, dehiscent into 4 valves or sometimes into 8 valves. *Seeds* glabrous.

Twining or erect herbs; leaves entire, often cordate; inflorescence cymose or capitate; flowers small, purple, blue, or white.

Species 30-40, natives of Africa and tropical America; 1 species found in Natal.

6993

7. CONVULVULUS, Linn.

Sepals 5, very various in shape, sub-equal, or the outer rarely larger than the inner. *Corolla* broadly, rarely narrowly, funnel-shaped or campanulate; limb plicate, 5-angled or rarely 5-lobed. *Stamens* 5, fixed near the base of the corolla, included; filaments often dilated at the base. *Ovary* 2-chambered, with 2 ovules in each chamber; stigmas 2, linear-terete, sub-clavate, slightly dilated, or filiform. *Fruit* a globose capsule, 2-locular, dehiscent into 4 valves or dehiscent irregularly. *Seeds* glabrous (always?).

Twining or erect herbs; leaves usually hastate or cordate; inflorescence an axillary cyme, or flowers solitary; flowers pedunculate, with a pair of bracts a short distance from each flower; corolla usually pinkish-white.

Species about 100, cosmopolitan, mainly in temperate and sub-tropical regions; 21 species in South Africa, with a fairly general distribution.

6994

8. CALYSTEGIA, R.Br.

Sepals sub-equal, or the inner slightly smaller. *Corolla* campanulate or infundibuliform; limb plicate, 5-angled, or obscurely 5-lobed. *Stamens* included; filaments dilated at the base. *Disc* annular, sometimes cupular. *Ovary* 1-chambered, or sometimes imperfectly 2-chambered, with 4 ovules; stigmas 2, distinct, campanulate, ovate or oblong. *Fruit* a sub-globose capsule. *Seeds* glabrous.

Herbs, prostrate or spreading, glabrous or scarcely pubescent; leaves alternate, entire, or rarely palmately-lobed; peduncle axillary, 1-flowered; bracts 2, large, persistent, enclosing the calyx; flowers usually large, white, rosy, or violet.

A temperate and sub-tropical genus of 7 or 8 species; doubtfully recorded from the Cape Peninsula.

6995

9. HEWITTIA, Wight & Arn.

Sepals 5, free to the base, leafy, unequal; the two outer larger than the three inner. *Corolla* broadly funnel-shaped or campanulate, with a plicate 5-angled limb; lobes very short. *Stamens* inserted at the base of the corolla-tube, included; the filaments dilated and with a few hairs at the base. *Ovary* densely pilose, imperfectly 1-chambered, with 4 ovules; stigmas 2, distinct, ovate, thick. *Fruit* a capsule, dehiscent into 4 valves. *Seeds* glabrous.

A twining pubescent herb; leaves broadly-cordate, entire, angled, or 3-lobed; flowers axillary, solitary or 2-3 together; bracts linear.

Species 1, spread throughout the tropics of the Old World; recorded in South Africa from Natal.

7000

10. ASTROCHLAENA, Hallier fil.

Calyx deeply 5-lobed, hairy outside. *Corolla* funnel-shaped, almost entire, with the central areas bounded by two conspicuous nerves. *Stamens* about half as long as the corolla. *Ovary* sub-globose, 2-chambered, with 2 ovules in each chamber; stigmas 2, linear-oblong, granular. *Fruit* a capsule. *Seeds* clothed with short or cobwebby hairs.

Herbs or sub-shrubs, covered with soft stellate hairs; stem usually simple; leaves petiolate, entire; flowers small or medium-sized, purple, or whitish from a purple base.

A tropical African genus of 10 species; 1 species extends into Natal.

7003

11. IPOMOEA, Linn.

Sepals 5, very various in shape and texture, free to the base. *Corolla* broadly funnel-shaped or campanulate, rarely hypocrateriform; limb 5-plicate, with the margin 5-angled, shortly (rarely deeply) 5-fid. *Stamens* 5, inserted low down in the corolla-tube, included; filaments sometimes dilated, often pilose at the base. *Disc* annular, entire or wavy, rarely 0. *Ovary* usually 2-chambered with 2 ovules in each chamber, or 4-chambered with a single ovule in each chamber, rarely 3-chambered with 2 ovules in each chamber; stigma sub-globose and entire or 2-lobed, or stigmas 2, globose, rarely with the stigma thick and sub-ovoid. *Fruit* a capsule, globose, rarely ovoid, membranous, leathery, or rarely somewhat succulent, dehiscing into 4 valves, rarely into 2 at the apex, rarely opening by an operculum or dehiscing irregularly. *Seeds* 4-6, or fewer by abortion, glabrous, pubescent, or silky-villous.

Twining or erect herbs or undershrubs; leaves very various in shape; inflorescence cymose, or flowers solitary; flowers often large and showy.

Species about 400, cosmopolitan in the tropical and warm temperate zones; 51 species in South Africa; absent in the south-western districts; rare in the south-eastern districts; otherwise generally dispersed.

7005

12. QUAMOCLIT, Tourn.

Calyx cup-shaped; lobes 5, mucronate. *Corolla* salver-shaped, with a long tube and distinct lobes. *Stamens* 5, exserted. *Ovary* 4-chambered, with a single ovule in each chamber; stigma capitate, 2-lobed. Otherwise as in *Ipomoea*.

Herbaceous climbers; leaves entire, or palmately-, or pinnately-lobed.

Species about 10, in the tropics of both hemispheres: 1 species in South Africa, probably introduced.

158. HYDROPHYLLACEÆ.

Flowers bisexual, regular. *Calyx* 5- or 10-12-lobed, sometimes appendiculate between the lobes. *Corolla* funnel-shaped, salver-shaped, campanulate, or rotate; lobes 5 or 10-12, imbricate, rarely contorted. *Stamens* as many as the corolla-lobes and alternating with them, usually fixed near the base of the corolla-tube, exserted or included; filaments sometimes dilated or appendiculate at the base; anthers 2-theous. *Disc* hypogynous, small, or 0. *Ovary* superior, either 1-chambered with 2 parietal placentas, or imperfectly or perfectly 2-chambered with 2 to many ovules in each chamber; style 2-fid, or styles 2 and free; stigma terminal, small, or capitate. *Fruit* a capsule, dehiscing loculicidally, rarely septicidally, into 2 valves, or dehiscing irregularly. *Seeds* 2 to many, oblong, globose, or angled, tuberculate, reticulate, or rugose, rarely smooth, with fleshy endosperm.

Annual or perennial herbs, rarely suffrutescent, usually hirsute or scabrid, sometimes densely bristly or spiny; leaves radical, alternate, rarely opposite, entire, toothed, or pinnately (rarely palmately) -lobed; inflorescence a bifid or dichotomous scorpioid cyme, with the flowers usually sub-sessile along one side of the branches, or in simple spikes or racemes, or axillary.

Genera 10, with about 150 species, chiefly in western North America, a few extending along the Andes to Chili; also in the tropics of the Old World, and the Sandwich Islands; 1 species in Japan.

7032

1. CODON, Linn.

Calyx 10-12-lobed; lobes linear, the alternate sometimes smaller. *Corolla* 10-12-lobed; tube widely campanulate, very slightly constricted at the middle, without scales inside; lobes imbricate; the alternate wider at the base. *Stamens* 10-12; filaments hirsute below the middle. *Ovary* spuriously 2-chambered by the intrusion of the placentas, with numerous ovules; style 2-fid. *Fruit* a 2-valved capsule; valves bearing the placentas on their centres. *Seeds* small, numerous, globose or angular, rugose.

Erect herbs, clothed all over with straight white spines; leaves alternate, petioled, simple, with the margins entire to sinuate-dentate; inflorescence a terminal cyme, or flowers solitary.

An African genus of 2 species; both species occur in South Africa, found in S.W. Africa, Namaqualand, and the Van Rhynsdorp and Ceres districts; 1 species extends into tropical Africa.

159. BORRAGINACEÆ.

Flowers bisexual, rarely with occasional unisexual flowers, regular, more rarely irregular. *Calyx* sometimes persistent; tube campanulate or cylindric, sometimes very short; lobes 5, rarely fewer or 6-8, longer or shorter than the tube, slightly imbricate or open, rarely valvate. *Corolla* 5, rarely 4- or 6 to many lobed; tube funnel-shaped, tubular, salver-shaped, campanulate, or rotate, with scales or folds in the throat; lobes imbricate, rarely plicate or contorted. *Stamens* as many as the corolla lobes and alternating with them, fixed in the throat or tube of the corolla; filaments sometimes dilated, sometimes with a scale at the base; anthers 2-theous. *Disc* annular, entire or 5-lobed, sometimes inconspicuous or obsolete. *Ovary* superior, confluent at the base with the disc, entire or more or less completely 2-4-lobed, 4-chambered, with a single erect ovule in each chamber, or ovule fixed to the inner angle of each chamber; style terminal on the entire ovary, gynobasic in the lobed ovary, entire, or once or twice divided; stigma terminal or annular below the apex of the style, entire or 2-lobed. *Fruit* fleshy and enclosing 4 pyrenes, or dry and divided into two 2-locular pyrenes, or into 4 (or by abortion fewer) 1-locular nutlets, flat or concave at the base, usually more or less oblique, spiny, rugose, or smooth. *Seeds* erect, oblique, or almost horizontal, straight or curved, with fleshy endosperm, or endosperm 0.

Annual or perennial herbs, shrubs, or trees, very rarely climbing, scabrid-pubescent, hispid, bristly, softly tomentose, woolly, or glabrous; leaves alternate, very rarely opposite or whorled, entire, toothed, or rarely lobed; stipules 0; inflorescence normally a dichotomous cyme with helicoid branches, sometimes a simple unilateral raceme or spike, more rarely of 1-2 axillary flowers; bracts leafy, small, or 0.

Genera 95; species about 1600, cosmopolitan.

Tribe **Cordieæ**: Style terminal, twice 2-fid; stigmas club-shaped or capitate; drupe of 4 or fewer 1-seeded loculi; endosperm 0; trees or shrubs (genus 1).

Tribe **Ehretieæ**: Style terminal on an entire or 4-lobed ovary, simple or 2-fid, or styles 2; drupe divided into two 2-locular or four 1-locular pyrenes; endosperm copious, scanty, or 0 (genus 2).

Tribe **Heliotropieæ**: Style terminal on an entire or 4-lobed ovary, short, or rarely elongated, with a depressed conic or elongated annulus below the apex (genera 3-4).

Tribe **Borragæ**: Style simple or 2-fid, between the lobes of the ovary; fruit of 4 nutlets, rarely 2 or fewer by abortion; endosperm 0 (genera 5-13).

1. Ovary entire or slightly 4-lobed; style terminal; fruit usually a drupe 2
- Ovary deeply 4-lobed; style from the base of the ovary; fruit dry, of 2-4 nutlets 5
2. Style deeply cleft, or twice 2-cleft; stigmas 2-4 3
- Style entire or shortly 2-lobed 4
3. Style twice 2-cleft; cotyledons plicate; endosperm none
1. **Cordia**, Linn.
- Style simply 2-cleft; cotyledons flat or plano-convex; endosperm scanty 2. **Ehretia**, Linn.
4. Trees or shrubs; fruit drupe-like, with 2-4 stones; endosperm fleshy, more or less copious 3. **Tournefortia**, Linn.
- Herbs or undershrubs, rarely shrubs; fruit dry, of 2-4 nutlets; endosperm scanty 4. **Heliotropium**, Linn.
5. Calyx much enlarged after flowering, enclosing the fruit; anthers produced at the apex into a long usually twisted appendage
5. **Trichodesma**, R.Br.
- Calyx not or slightly enlarged after flowering; anthers without terminal appendages 6
6. Nutlets spiny; corolla-tube with scales in the throat 7
- Nutlets crenate or winged on the margins, or rugose, or granular, not spiny; corolla-tube with or without scales in the throat 8
7. Nutlets nearly flat on the back; their tips scarcely or not projecting above their surface of attachment 6. **Cynoglossum**, Linn.
- Nutlets not depressed, usually margined; their tips considerably projecting above their surface of attachment 8. **Lappula**, Moench.
8. Flowers irregular; filaments with a tuft of hairs, ciliated scales, or longitudinally scattered hairs at the base, rarely glabrous 9
- Flowers regular; filaments glabrous 10
9. Style entire; filaments with a tuft of hairs or ciliated scales at the base 12. **Lobostemon**, Lchm.
- Style 2-cleft at the apex; filaments with scattered hairs at the base or glabrous 13. **Echium**, Linn.
10. Bracts absent, or a few only at the base of the inflorescence; nutlets smooth 10. **Myosotis**, Linn.
- Bracts present; nutlets smooth or rugose 11
11. Scales present in the corolla-throat 12
- Corolla-throat naked, sometimes gibbous or with 5 folds, but no scales 11. **Lithospermum**, Linn.
12. Stamens exserted; ovary indistinctly 4-lobed at the apex, seated on a thick semi-globose torus 7. **Tysonia**, Bolus
- Stamens included; ovary of 4 distinct lobes, seated on a small flat disc 9. **Anchusa**, Linn.

7038

1. **CORDIA**, Linn.

Calyx tubular or campanulate, 3-5-toothed, often enlarged in fruit. *Corolla* 5 to many-lobed; lobes imbricate or somewhat contorted. *Stamens* as many as the corolla-lobes, exserted or included. *Ovary* 4-chambered, with a single erect ovule in each chamber; style 2-fid, its branches more or less

deeply 2-fid; stigmas capitate or clavate. *Fruit* a drupe of 4 or fewer 1-seeded loculi. *Seeds* without endosperm; cotyledons plicate.

Trees or shrubs; leaves alternate, rarely sub-opposite, petiolate, entire or toothed; inflorescence a cyme, spike, or head; flowers usually yellow or white.

Species about 250, distributed throughout the warmer regions of both hemispheres; 1 species in South Africa, found in Natal and then from East London to the Uitenhage district; extends into the Karroo.

7043

2. EHRETIA, Linn.

Calyx small, 5-partite. *Corolla* 5-lobed; lobes imbricate. *Stamens* 5, fixed to the corolla-tube, usually exserted. *Ovary* 2-chambered, or more or less perfectly 4-chambered, with a single ovule in each chamber inserted at or above the centre of the chamber; style 2-fid; stigma capitate or clavate. *Fruit* a small, usually globose, drupe, divided into two 2-locular or four 1-locular pyrenes. *Seed* with scanty endosperm; cotyledons not plicate.

Trees or shrubs; leaves alternate, entire or toothed; inflorescence a corymbose cyme or panicle, terminal and also axillary in the upper part of the stem; flowers usually white.

Species about 50, found in the hotter parts of both hemispheres; 2 species in South Africa; absent from the south-western districts, otherwise widely distributed; found in the Uitenhage district.

7051

3. TOURNEFORTIA, Linn.

Calyx 5-partite; lobes imbricate or open. *Corolla* 5-lobed; tube cylindric, with a slight swelling at the insertion of the stamens, naked in the throat; lobes imbricate or induplicate. *Stamens* 5, included. *Disc* scarcely any, or cup-shaped. *Ovary* entire, 4-chambered, with a single pendulous ovule in each chamber; style terminal, with a stigmatic ring beneath the obtusely 2-lobed apex. *Fruit* a small drupe of 4 pyrenes. *Seeds* pendulous; endosperm copious or sparse, fleshy.

Trees, or sometimes climbing shrubs, rarely suffruticose; leaves alternate, quite entire; inflorescence usually a dichotomous corymbose cyme, terminal.

Species about 100, found in the tropics of both hemispheres; 1 species in South Africa, found in S.W. Africa, Griqualand West, and some north-western and central districts.

7052

4. HELIOTROPIMUM, Linn.

Calyx more or less deeply 5-lobed. *Corolla* 5-lobed; tube cylindric, naked in the throat; lobes imbricate or induplicate. *Stamens* 5, fixed in the corolla-tube, included. *Ovary* 4-lobed, 4-chambered, or with each chamber again almost divided into 2, with a single pendulous ovule in each chamber; style terminal, with a depressed conic or broad stigmatic ring below the apex. *Fruit* somewhat fleshy, 2- or 4-sulcate or -lobed, at length dividing into 4 distinct or geminately cohering nutlets. *Seeds* with usually scanty endosperm; cotyledons plano-convex.

Herbs or undershrubs, rarely shrubs; leaves alternate, rarely sub-opposite; inflorescence a forked scorpioid cyme, or a simple leafy raceme.

Species about 150, found throughout the tropical and temperate regions of the world; 6 species in South Africa, chiefly in the north-western and central districts, and extend to the Uitenhage district and to the Cape; absent from Natal, but recorded from the Transvaal.

7056

5. TRICHODESMA, R.Br.

Calyx deeply 5-lobed, enlarged in fruit, angled, winged, or auricled at the base; lobes imbricate. *Corolla* 5-lobed; tube widely cylindric or 5-sided, naked in the throat or slightly closed by the intrusion of the sinuses; lobes contorted, overlapping to the left. *Stamens* 5, exerted; filaments hairy on the back; anthers long-acuminate, conniving at the apex. *Ovary* 4-lobed, 4-chambered, with a single sub-horizontal ovule fixed to the inner angle of each chamber; style sub-terminal; stigma small. *Fruit* of 4 nutlets, tuberculate or almost smooth on the back, with or without a raised entire pectinate or glochidiate margin, lower face almost entirely adnate to the torus. *Seeds* sub-orbicular or obovate; cotyledons plano-convex.

Erect herbs, usually hispid; leaves opposite or alternate, quite entire; inflorescence a terminal racemose cyme, unilateral, simple or bifid, usually bracteate.

Species 10, distributed in the tropics and sub-tropics of Asia, Africa, and Australia; 3 species in South Africa, found in S.W. Africa, the Transvaal and extending into the O.F.S. and the north-western districts; recorded in the south from the Ceres district.

7064

6. CYNOGLOSSUM, Linn.

Calyx 5-partite, scarcely enlarged in fruit. *Corolla* 5-lobed; tube closed with obtuse or arched scales in the throat; lobes imbricate. *Stamens* fixed in the corolla-tube, included. *Ovary* distinctly 4-lobed from an almost flat receptacle, with a single horizontal ovule in each chamber fixed to the central angle; stigma flat or sub-capitate. *Fruit* of 4 nutlets, depressed, scarcely produced at the apex beyond the conical receptacle, rather convex or flat on the dorsal side, or surrounded by an elevated margin, glochidiate. *Seeds* straight or slightly curved; cotyledons flat.

Perennial or biennial herbs, slightly branched, canescent-villous, or almost woolly; leaves alternate; the radical often long-petioled; inflorescence usually an elongated raceme, sparingly branched or loosely paniced, rarely bracteate; flowers pedicelled or sub-sessile, blue or violet, with distinct veins, rarely white; pedicels usually recurved in fruit.

Species about 60, found in the temperate and sub-tropical regions of both hemispheres; 2 species in South Africa, fairly widely distributed.

7072

7. TYSONIA, Bolus'

Calyx 5-partite, persistent, but scarcely enlarging. *Corolla* 5-lobed; tube with 5 erect exerted quadrate-oblong retuse scales in its throat and about 10 small swellings at its very base; lobes as long as the tube. *Stamens* 5, exerted; filaments enlarged at the base. *Ovary* seated on a thick semi-globose torus, indistinctly 4-lobed at the apex, 4-chambered, with a horizontal ovule fixed to the inner angle of each chamber; style undivided; stigma capitate. *Fruit* of 1-3 nutlets, much laterally compressed, one often larger and produced at its margin into a wide wavy cartilaginous crenate wing, the others smaller and more narrowly winged. *Seed* erect, ovate, compressed; endosperm 0; cotyledons cuneate-obovate, plano-convex.

A large herb; leaves alternate, petioled, larger at the base of the stem; inflorescence a lax terminal panicle of cymes.

Endemic; species 1, found in Griqualand East.

7073

8. LAPPULA, Moench.

(Echinosperrum, Swartz)

Calyx 5-partite. *Corolla* 5-lobed; tube clothed inside with 5 short or arching scales; lobes imbricate. *Stamens* 5, fixed to the corolla-tube, included. *Ovary* shortly 4-lobed, with a single laterally fixed ovule in each chamber; style between the lobes; stigmas sub-capitate. *Fruit* of 4 nutlets, erect, keeled on the inner face and often bordered by one or more rows of glochidiate prickles. *Seeds* straight; cotyledons plano-convex.

Annual or perennial herbs, canescent, villous, or glabrescent, usually erect, virgate or much branched; leaves alternate; inflorescence a raceme, bracteate or naked towards the apex; flowers small, sessile or pedicelled; pedicels sometimes thickened in the fruit.

Species about 50, found chiefly in the temperate regions of Europe and Asia; a few in North America and Australia; 3 species in South Africa, absent from the south-western districts, otherwise widely distributed.

7093

9. ANCHUSA, Linn.

Calyx more or less deeply 5-lobed; lobes a little enlarged in fruit. *Corolla* 5-lobed; tube closed at the throat with obtuse or arching papillose scales; lobes imbricate. *Stamens* 5, fixed in the middle of the corolla-tube, included. *Ovary* distinctly 4-lobed, on a small flat disc. *Fruit* of 4 erect oblique or incurved rugose nutlets. *Seeds* straight; cotyledons ovate, flat.

Annual or perennial herbs, hispid, villous, or bristly; leaves alternate; inflorescence a dichotomous cyme, or a simple unilateral raceme, terminal, usually at length loosely panicle, sometimes without bracts; flowers blue, violet, or white, rarely yellowish.

Species about 30, in Europe, western Asia, and north Africa; 2 species in South Africa, found in Namaqualand, Griqualand West, a few central districts, and extending into Tembuland, the Albany and Swellendam districts, and a few of the south-western districts; absent from the Transvaal and Natal.

7100

10. MYOSOTIS, Linn.

Calyx shortly or deeply 5-lobed; lobes slightly enlarging in fruit. *Corolla* 5-lobed; tube gibbous, almost closed by scales, or naked; lobes contorted to the right. *Stamens* fixed to the corolla-tube, included or exerted. *Ovary* distinctly 4-lobed, on a flat disc, with an erect ovule in each chamber; stigma small, entire or slightly 2-lobed. *Fruit* of 4 distinct nutlets; nutlets ovoid, erect, hard, shining. *Seed* straight; cotyledons ovate, flat or plano-convex.

Annual or perennial herbs, villous or more rarely glabrous; leaves alternate; inflorescence a simple or branched racemose cyme, ebracteate or more rarely with a few leafy bracts at the base; flowers blue, red, or white.

Species about 40, widely spread in the temperate regions of the Old World; 5 species in South Africa, found in the Transvaal, Natal, the eastern Orange Free State, the north-eastern districts, and Pondoland, then recorded from George and Knysna.

7109

11. LITHOSPERMUM, Linn.

Calyx 5-partite, rarely 5-fid. *Corolla* 5-lobed; tube with the throat usually enlarged, naked or gibbous within, or with 5 folds intruded from the outside; lobes imbricate. *Stamens* 5, fixed to the corolla-tube, included. *Ovary* distinctly 4-lobed, on a flat disc, with an erect ovule in each chamber; stigmas 2, terminal or overtopped by a short entire or bifid apiculus, very rarely annular beneath the terminal apiculus. *Fruit* of 4 nutlets, or by abortion fewer; nutlets erect, ovoid, or acuminate, usually stony, smooth or rugose. *Seed* straight; cotyledons flat.

Herbs, undershrubs, or shrubs, roughly canescent or hispid; leaves alternate; inflorescence a leafy spike, raceme, or cyme, or flowers solitary in the axils of the upper leaves; flowers white, yellow, bluish, or violet.

Species about 40, found chiefly in the extra-tropical regions of the northern hemisphere; a few in western South America, 11 species in South Africa, fairly widely distributed, but absent from the south-eastern districts; 1 species recorded from the Cape.

7117

12. LOBOSTEMON, Lehm.

Calyx 5-partite. *Corolla* 5-lobed; tube naked inside the throat; lobes imbricate. *Stamens* 5, fixed in the corolla-tube, exserted or included; filaments with a scale or transverse tuft of hairs at the base. *Ovary* distinctly 4-lobed, on a flat or very slightly convex disc; style undivided, stigma small, sub-capitate. *Fruit* of 4 distinct nutlets; nutlets erect, ovoid-trigonal, or acuminate, granular-scabrid or rugose. *Seeds* straight.

Perennial herbs, shrubs, or sub-shrubs, scabrid-canescant or hispid; leaves alternate, sessile, with simple or bulbous-based hairs, rarely almost glabrous; inflorescence a terminal cyme, head, spike, or panicle; flowers white, blue, or purple.

An African genus of about 50 species; 46 species in South Africa, chiefly in the south-western districts, but extending from Namaqualand to Albany; rare in the southern central districts.

7118

13. ECHIUM, Linn.

Calyx 5-partite. *Corolla* 5-lobed; tube naked inside; lobes imbricate. *Stamens* 5, inserted below the middle of the corolla-tube, usually unequal and exserted; filaments often dilated at the base. *Ovary* distinctly 4-lobed, on a flat disc; style shortly bifid at the apex; stigmas small. *Fruit* of 4-nutlets; nutlets distinct, erect, ovoid, or acuminate, rugose. *Cotyledons* ovate, flat.

Herbs or shrubs, scabrid, hispid, or canescent; leaves alternate; inflorescence a unilateral scorpioid cyme, simple or forked; bracts small, or large and leafy; flowers blue, violet, or red, rarely white.

Species about 40, found in Europe, western Asia, north Africa, the Canary Islands and the Azores; 2 species in South Africa, found in the south-western districts.

160. VERBENACEÆ.

Flowers bisexual, rarely with occasional unisexual flowers, irregular or, in a few genera, regular. *Calyx* persistent, gamosepalous, can panulate, tubular, cup-shaped, or rotate, with 4-5 (or rarely 6-8) lobes or teeth, rarely sub-truncate. *Corolla* gamopetalous; tube usually cylindric or dilated above, often curved; limb 5-4- (or rarely many-) lobed, regular or more or less 2-lipped; the lowest lobe innermost in the bud. *Stamens* 4, perfect, didynamous, or 2, rarely 5, inserted on the corolla-tube and alternating with the lobes; the uppermost or upper 3 usually reduced to staminodes or absent; anthers with 2 distinct parallel or divergent thecae. *Disc* usually inconspicuous, sometimes thickened and fleshy beneath the ovary, very rarely annular. *Gynaecium*, formed of 2 (or, by abortion, 1) carpels, syncarpous; ovary superior, 4-furrowed or rarely shortly 4-lobed, in the young condition normally 1-chambered, later becoming 2-chambered by the intrusion of the ovuliferous margins of the carpels, more rarely 8-chambered, with 2 or (by abortion) 1 ovule, later becoming 2-chambered

by the formation of a spurious septum between the ovules; style at the apex, entire, bifid, or rarely 4-lobed. *Ovules* erect, pendulous or laterally attached to the infolded margins of the carpels, or rarely to a central column. *Fruit* usually more or less drupaceous. *Seeds* always separate in distinct loculi; endosperm fleshy, or 0.

Herbs, shrubs, or trees; branches often 4-angled; leaves, except in a few genera, opposite or whorled, entire, toothed, incised, or rarely digitately compound; stipules 0; inflorescence a spike, raceme, or cymose; bracts usually small.

Genera about 73, with about 700 species, found in the tropical regions of both hemispheres; very few in sub-tropical and temperate areas.

Tribe **Stilbeæ**: Low shrubs of ericoid habit; inflorescence a spike or raceme; ovary 2-chambered, with a single basal erect anatropous ovule in each chamber; seed with endosperm (genera 1-5).

Tribe **Verbeneæ**: Herbs or shrubs, not ericoid; inflorescence a spike or raceme; ovary 2- or 4-chambered, rarely more or less perfectly 8-chambered, with a single basal erect anatropous ovule in each chamber; seed with endosperm (genera 6-11).

Tribe **Viticeæ**: Trees or shrubs; inflorescence cymose, with the cymes panicle, corymbose, umbellate, or sometimes reduced to a single flower; ovary completely or incompletely 4-chambered, with a single ovule inserted laterally in each chamber (genera 12-14).

Tribe **Avicenniæ**: Shrubs; inflorescence cymose, with the cymes in heads; ovary incompletely 4-chambered, with a single pendulous ovule in each chamber (genus 15).

1. Throat of corolla hairy 2
- Throat of corolla naked 6
2. Ovary 2-lobed; bracts broad and sheathing at the base 3
1. **Campylostachys**, *Kunth*
- Ovary entire; bracts not sheathing at the base 3
3. Corolla 5-lobed, with the lobes equal or sub-equal 4
- Corolla 2-lipped 5
4. Calyx symmetric, or with the 3 upper teeth or lobes slightly larger than the 2 lower; leaves in whorls of 3-7 2. **Stilbe**, *Berg.*
- The 3 upper calyx-segments connate into a broad 3-toothed lip; the 2 lower segments free; leaves crowded, verticillate 3. **Euthystachys**, *A.DC.*
5. Calyx prominently 5-angled; upper lip of corolla 2-lobed; lower lip 3-partite 5. **Eurylobium**, *Hochst.*
- Calyx 2-lipped, truncate; upper lip of corolla of 2 free segments; lower lip of 3 equal segments 4. **Xeroplana**, *Briq.*
6. Ovary more or less completely 8-chambered; style unequally 4-lobed at the apex 11. **Duranta**, *Linn.*
- Ovary 2-4-chambered; style entire or 2-fid at the apex 7
7. Ovary 2-chambered 8
- Ovary 4-chambered 10
8. Calyx prominently 5-ribbed 9. **Bouchea**, *Cham.*
- Calyx not ribbed, sometimes 2-keeled 9
9. Fruit a small drupe 7. **Lantana**, *Linn.*
- Fruit dry; calyx 2-keeled 8. **Lippia**, *Linn.*
10. Inflorescence a spike; calyx 5-ribbed; ovule erect, basal 11
- Inflorescence cymose; calyx not prominently ribbed; ovule lateral or pendulous 12
11. Calyx accrescent in fruit; fruit separating into 2 pyrenes, each with 2 seeds 10. **Priva**, *Adans.*
- Calyx unchanged, or very slightly accrescent in fruit; fruit separating into 4 pyrenes, each with 1 seed 6. **Verbena**, *Linn.*
12. Corolla 4-lobed 15. **Avicennia**, *Linn.*
- Corolla 5-lobed 13
13. Calyx rotate; tube very short, urceolate at the base, much enlarged in the fruit 14. **Holmskioldia**, *Retz.*
- Calyx campanulate or tubular, not much enlarged in fruit 14

14. Drupe entire, containing a single 4-chambered pyrene; leaves usually digitately compound **12. Vitex, Linn.**
 Drupe 4-lobed or -furrowed, separating into four 1-seeded pyrenes; leaves simple **13. Clerodendron, Linn.**

7133

1. CAMPYLOSTACHYS, Kunth

Calyx deeply 5-lobed, or sepals free. *Corolla* 4- (sometimes 5-) lobed; tube short, hairy within at the throat; lobes oblong, sub-equal. *Stamens* 4, equal, inserted between the corolla-lobes in the upper part of the tube; anthers with parallel thecae, distinctly separated below. *Ovary* 2-lobed, 2-chambered, with a single erect basal ovule in each chamber; style glabrous, minutely 2-lobed at the apex. *Fruit* shorter than the calyx, oblong-ovate, at first 2-grooved, later dehiscent by 4 valves. *Seed* solitary, erect, large, with a reticulately wrinkled testa.

Erect ericoid shrubs; leaves crowded in whorls, subulate or linear-subulate, with revolute margins; inflorescence a short capitate terminal spike, sessile among the leaves; flowers solitary in the axils of the bracts; bracts subulate above the middle, much broadened and sheathing at the base; bracteoles 2, subulate, oblique, keeled.

Endemic; species 1, extending from the Cape to the Swellendam district.

7134

2. STILBE, Berg.

Calyx 5-toothed or 5-partite; lobes equal or with the 3 upper teeth or lobes larger. *Corolla* 5-lobed; tube narrow, somewhat widening upwards, with a ring of erect white hairs in the throat; lobes equal. *Stamens* 4, sub-equal, inserted at the top of the corolla-tube between the lobes; anthers with parallel thecae, separated below. *Ovary* 2-chambered, with a single erect basal ovule in each chamber, sometimes by abortion 1-chambered and 1-ovuled; style entire or minutely bifid. *Fruit* oblong, enclosed in the calyx, 2-lobed, 2-locular (or, by abortion, 1-locular and 1-seeded), indehiscent. *Seed* erect, with the testa pitted or reticulately wrinkled.

Erect ericoid shrubs; leaves in whorls of 3-7, erect, spreading, or reflexed, with revolute margins, passing upwards into bracts; inflorescence a dense terminal spike, sessile among the upper leaves; bracteoles 2, narrow.

Endemic; species 5, extending from Clanwilliam to the Riversdale district.

7135

3. EUTHYSTACHYS, A.DC.

Calyx of 5 sub-equal sepals; the 3 upper connate into a broad 3-toothed lip; the 2 lower free. *Corolla* 5-fid; tube funnel-shaped, bearded in the throat; lobes equal. *Stamens* 4, sub-equal or didynamous, inserted in the throat of the corolla between the lobes; anther-thecae divergent below. *Ovary* 2-chambered, with a single erect basal ovule in each chamber; style undivided. *Fruit* not seen.

Erect ericoid shrubs; leaves numerous, crowded, verticillate, with revolute margins; inflorescence a terminal or lateral few-flowered compact spike, sessile among the leaves; flowers solitary in the axils of leaf-like bracts which overtop them; bracteoles 2.

Endemic; species 1, found on the Drakenstein Mountains.

7136

4. XEROPLANA, Briq.

Calyx 5-toothed, 2-lipped; tube narrow; upper lip 3-toothed; lower lip of 2 free lobes. *Corolla* 2-lipped; tube slender, cylindric, slightly dilated at the mouth, more or less pilose within the throat; upper lip of 2 free

segments ; lower lip of 3 equal segments, much shorter than the upper lip. *Stamens* 4, sub-equal, inserted in the corolla-throat between the segments, exserted ; anthers with parallel thecae. *Ovary* 2-chambered, with a single erect basal ovule in each chamber ; style exserted, slightly capitate at the apex. *Mature fruit* unknown.

A low branched ericoid shrub ; leaves in whorls of 3, crowded, with revolute margins ; inflorescence a terminal spike, sessile among the upper leaves ; flowers solitary, sessile in the axils of the leaf-like bracts ; bracteoles 2, shorter than the flowers.

Endemic ; species 1, locality uncertain.

7137

5. EURYLOBIUM, Hochst.

Calyx membranous, 5-toothed ; tube prominently 5-angled ; teeth equal. *Corolla* 2-lipped ; tube narrowly funnel-shaped, bearded within the throat ; upper lip 2-lobed to about the middle ; lower lip 3-partite, smaller than the upper lip ; lobes ovate, 3-nerved. *Stamens* 4, sub-equal or didynamous, inserted in the throat of the corolla between the lobes ; anther-thecae divergent below. *Ovary* 2-chambered, with a single erect basal ovule in each chamber ; style not conspicuously divided at the apex. *Mature fruit* unknown.

Low ericoid shrubs ; leaves crowded in whorls, with revolute margins ; inflorescence a terminal compact spike, sessile among the upper leaves ; flowers solitary in the axils of leaf-like bracts ; bracteoles 2.

Endemic ; species 1, recorded from the Caledon district.

7138

6. VERBENA, Linn.

Calyx 5-toothed ; tube 5-ribbed. *Corolla* sub-2-lipped ; tube cylindric or slightly dilated upwards ; lobes 5, obtuse or emarginate ; the 2 upper lobes outside in the bud. *Stamens* 4, didynamous, inserted about or above the middle of the corolla-tube, included ; anthers with parallel or somewhat diverging thecae, without appendages, or with the connective of the front pair produced above into a clavate or glanduliform appendage. *Ovary* entire at the apex or very shortly 4-lobed, 4-chambered, with a single basal erect ovule in each chamber ; style divided at the apex into a short stigmatic lobe and an acute tooth. *Fruit* dry, hard, enclosed in the calyx, separating when ripe into 4 narrow cocci.

Herbs or low shrubs ; leaves opposite, seldom whorled or alternate, toothed, often incised or partite, seldom entire ; inflorescence a terminal, seldom axillary, spike, densely crowded or elongate, often corymbose or paniced ; bracts narrow.

Species about 80, found in the tropical and extra-tropical regions of the New World ; a few also in the Old World ; 3 species (introduced) in South Africa, found in the Transvaal, Natal, the Transkei, and in the Cape.

7144

7. LANTANA, Linn.

Calyx tubular, truncate, 4-toothed, or 2-lipped. *Corolla* 4-5-lobed or obscurely 2-lipped ; tube narrow, cylindric, usually somewhat wider above the middle ; lobes sometimes emarginate. *Stamens* 4, didynamous, inserted about the middle of the corolla-tube, included ; anthers with parallel thecae. *Ovary* 2-chambered, with a single erect basal ovule in each chamber ; stigma thickened, oblique or sub-lateral. *Fruit* drupaceous, 2-locular, or separating when ripe into two 1-locular 1-seeded portions.

Shrubs, seldom herbs, erect, scabrid, pubescent, or tomentose ; leaves opposite, toothed, serrate, or crenate, usually rugose ; inflorescence (in the South African species) an axillary peduncled many-flowered spike, contracted into small sub-globose or cylindric heads ; flowers solitary in the axils of the bracts ; bracteoles minute, or 0.

Species about 50, mostly tropical American ; 3 species in South Africa, recorded from the Cape, then from Mossel Bay to Natal and the Transvaal ; also found in some of the central districts.

7145

8. LIPPIA, Linn.

Calyx 2-4-lobed, 4-toothed, more or less truncate, 2-keeled, slightly accrescent ultimately 2-valved, enclosing (sometimes adhering to) the fruit. *Corolla* 4-lobed, more or less 2-lipped ; tube cylindric, somewhat widened at the throat, rarely shorter than the bract ; lobes broad, frequently emarginate ; the lower somewhat larger than the upper ; the lateral equal, smaller than the upper. *Stamens* 4, didynamous, inserted near the middle of the corolla-tube, included or somewhat exserted ; anthers with parallel thecae. *Ovary* 2-chambered, with a single erect basal ovule in each chamber ; stigma terminal, oblique or recurved, thickened. *Fruit* small, with a dry epicarp, enclosed in the slightly accrescent closely adpressed calyx, easily separated into two 1-seeded portions.

Shrubs or undershrubs, rarely herbs ; leaves opposite, or in whorls of 3 (occasionally 4), rarely alternate ; inflorescence an elongated and lax cylindric dense spike, or a short and sub-globose spike, becoming more or less cylindric as the fruit matures.

Species about 110, chiefly natives of tropical America ; a few in tropical Africa ; 8 species in South Africa, extending from the Transvaal and Natal to Grahamstown ; also found in the Orange Free State and Bechuanaland ; one record from the Cape.

7148

9. BOUCHEA, Cham.

Calyx obliquely truncate or 5-toothed ; tube narrow, prominently 5-ribbed, usually becoming more or less dilated below as the fruit ripens, at length splitting longitudinally in front. *Corolla* 5-lobed ; tube slender, cylindric, slightly widening at the throat ; lobes sub-equal, broad, obtuse or emarginate. *Stamens* 4, didynamous, inserted in the upper part of the corolla-tube, included ; anthers with parallel thecae. *Ovary* 2-chambered, with a single erect basal ovule on a short stalk in each chamber ; style divided unequally at the apex into a club-shaped stigmatic lobe and a small or minute tooth. *Fruit* usually shorter than the calyx-tube and enclosed in it, either not splitting or splitting into two 1-seeded cocci.

Perennial herbs or low undershrubs ; leaves opposite or sub-opposite, toothed or incised, seldom entire ; inflorescence a terminal spike or a simple spicate raceme ; bracts small, usually narrow ; bracteoles minute, or 0.

Species about 25, natives of Africa, America, and India ; 13 species in South Africa, widely distributed.

7153

10. PRIVA, Adans.

Calyx shortly 4-toothed ; tube prominently 5-ribbed, with the ribs terminating in the teeth, tubular, contracted at the throat. *Corolla* 5-lobed, sub-2-lipped ; tube cylindric, slightly widening upwards ; the 2 upper lobes usually shorter than the lower lobes. *Stamens* 4, didynamous, inserted at the middle of the corolla-tube, included, sometimes a staminode present ; anther-thecae parallel or slightly divergent below. *Ovary* 4-chambered, with a single basal erect ovule in each chamber ; style divided at the apex into a stigmatic lobe and a minute or obsolete tooth. *Fruit* dry, enclosed in the dilated calyx-tube, separating when ripe into two 2-chambered 2-seeded (or by abortion 1-seeded) cocci ; coccus hard, muricate, rugose, or smooth without, flat, concave, or excavated on the inner face.

Erect glabrous pubescent or villous herbs; leaves opposite, toothed; inflorescence a simple spike or spicate raceme, terminal or axillary, pedunculate, elongated; bracts small, narrow; bracteoles minute or absent.

Species about 10, in the warmer regions of both hemispheres; 10 species in South Africa, recorded from the Transvaal, Natal, and the Transkei to the Uitenhage district; also recorded from the Albert and Somerset East districts.

7162

11. DURANTA, Linn.

Calyx truncate or minutely 5-toothed, accrescent in fruit, closely adpressed to the enclosed drupe but free from it, and usually constricted at the mouth; teeth minute. *Corolla* 5-lobed; tube cylindric; lobes equal or sub-equal. *Stamens* 4, didynamous, inserted at or above the middle of the corolla-tube, included; anthers with distinct parallel thecae. *Gynaecium* of 4 carpels; ovary more or less perfectly 8-chambered, with a solitary erect basal ovule in each chamber; style unequally 4-lobed at the apex. *Drupe* quite (rarely almost) enclosed in the accrescent calyx, with juicy epicarp and bony endocarp; pyrenes 4, each 2-locular and 2-seeded.

Shrubs, unarmed, or with axillary or supra-axillary spines; leaves opposite or whorled, entire or toothed; inflorescence a terminal, rarely axillary, raceme, usually panicle; bracts small.

Species about 8, ranging from Bolivia and Brazil to the West Indies and Mexico; 1 species introduced into South Africa, recorded from the Transvaal and Natal.

7186

12. VITEX, Linn.

Calyx 5-toothed or 5-lobed, very rarely 3-lobed, usually enlarged in the fruit; tube campanulate, rarely more or less funnel-shaped. *Corolla* 5-lobed, sub-2-lipped; tube cylindric, slightly dilated at the throat; the 2 upper lobes shorter than the other 3, outside them in bud, helmet-shaped, erect or reflexed; the lowest lobe the largest, entire or emarginate. *Stamens* 4, didynamous, exserted or included; anthers with distinct thecae which are parallel diverging or curved and affixed to the filaments by their apices. *Ovary* 4-chambered, with a single lateral ovule in each chamber; style shortly and acutely bifid at the apex. *Drupe* sessile, rarely enclosed in the usually accrescent calyx, with the epicarp more or less fleshy, 4-locular. *Seeds* obovate or oblong, without endosperm.

Trees or shrubs, usually with depressed sessile glands on the leaves and flowers; leaves opposite, rarely in whorls of 3, frequently digitately compound with 3-7 leaflets, sometimes 1-foliolate and simple; inflorescence an axillary sessile or pedunculate cyme, with the cymes arranged in a terminal panicle, or rarely contracted and capitate; bracts small, seldom exceeding the calyx.

Species about 120, found in the warm regions of both hemispheres; a few extending to the temperate regions in south Europe and Asia; 9 species in South Africa, found in the Transvaal, Natal, and Bechuanaland; also recorded from the Komgha district.

7191

13. CLERODENDRON, Linn.

Calyx truncate, 5-toothed or 5-lobed; tube campanulate, rarely tubular. *Corolla* 5-lobed; tube narrow, cylindric; lobes sub-equal or the 4 upper shorter and the lowermost produced, sometimes concave. *Stamens* 4, inserted below the corolla-throat, exserted; anthers with parallel thecae. *Gynaecium* of 2 carpels; ovary imperfectly 4-chambered, with a single lateral ovule in each chamber; style shortly and acutely 2-lobed at the apex. *Drupe* globose or obovoid, usually 4-furrowed or 4-lobed, with a more or less fleshy epicarp, separating into 4 (or by abortion fewer) pyrenes, distinct or cohering in pairs. *Seeds* oblong, without endosperm.

Trees or shrubs, sometimes climbing, usually unarmed; leaves opposite or whorled; inflorescence usually a lax cyme, pedunculate in the axils of the upper leaves, or panicleate at the apices of the branches, or crowded in a terminal corymb or head.

Species about 100, found chiefly in the warm parts of the Old World; a few in tropical America and east India; 10 species in South Africa, found in the Transvaal, Natal, and the Transkei to the Albany district; also recorded from Bechuanaland.

7192

14. HOLMSKIOLDIA, Retz.

Calyx obscurely 5-lobed, very accrescent; tube with a short urceolate base. *Corolla* 5-lobed; tube incurved, dilated upwards; lobes spreading, unequal. *Stamens* 4, didynamous, inserted low down in the corolla-tube, exserted; anthers with parallel thecae. *Ovary* entire or obscurely 4-lobed, 4-locular, with a single lateral ovule in each loculus; style long, exserted, bifid at the apex. *Drupe* enclosed in the urceolate base of the persistent calyx-tube, truncate or lobed; endocarp of 1-4 bony pyrenes. *Seed* oblong, without endosperm.

Erect shrubs; leaves opposite; inflorescence an axillary or terminal cyme; bracts small, deciduous.

Species 4 or 5, natives of tropical Africa and India; 1 species found in the northern Transvaal.

7205

15. AVICENNIA, Linn.

Calyx 5-partite; lobes broadly ovate, imbricate. *Corolla* 4-lobed; tube short, wide, cylindric; lobes sub-equal, or the uppermost a little broader. *Stamens* 4, inserted in the throat of the corolla-tube, scarcely exserted; anthers with parallel thecae. *Ovary* imperfectly 4-chambered, with a central 4-winged conical column, and with a single ovule pendulous from the apex of the axile placental column. *Fruit* dry, compressed, dehiscent by 2 thickened valves, 1-seeded. *Embryo* naked on account of the arrested development of the integuments of the ovule, with the plumule commencing to grow before the fruit falls.

Shrubs; leaves opposite; inflorescence a contracted head-like peduncled cyme, usually paired in the axils of the upper leaves, or arranged in a short thyrsus or trichotomous corymb at the apex of the branch; bracts and bracteoles shorter than the calyx.

Species about 3, found on the tropical shores of both hemispheres; 1 species in South Africa, found on the shores of Natal.

161. LABIATÆ.

Flowers irregular, or more rarely regular or sub-regular, bisexual or rarely unisexual. *Calyx* tubular, campanulate, or funnel-shaped, regularly or irregularly 3-10- (usually 5-, rarely many-) toothed, or with 2 entire or toothed lips, very rarely truncate or 5-partite, persistent and often enlarged in fertile flowers, very rarely deciduous above the base at the ripening of the fruit. *Corolla* gamopetalous, 2- (rarely 1-) lipped, or oblique or sub-regular and 4-5-lobed, deciduous. *Stamens* usually 4 (occasionally only 2) in 2 pairs of unequal lengths, or sub-equal, all fertile or the upper pair sterile, inserted in or at the mouth of the corolla-tube; anthers 1- or 2- thecous; thecae often divergent. *Ovary* superior, seated on an entire or lobed disc, deeply or rarely shortly 4-lobed, 4-chambered, with a single erect ovule in

each chamber. *Fruits* of 4, or by abortion fewer, dry 1-seeded nutlets. *Seeds* erect; endosperm little or none; embryo straight or rarely curved, with fleshy cotyledons.

Herbs or shrubs, usually with square stems and branches, often odoriferous; leaves opposite, whorled, or rarely alternate, entire, toothed, or lobed, usually gland-dotted; stipules 0; flowers solitary and opposite, or more usually 3 to many in a whorl and the pairs of whorls spaced out in terminal racemes, or along the branches of a panicle, or crowded into a head or corymb, or seated in the axils of foliage leaves, bracteate or with bracteoles mingled with the flowers.

Genera about 170; species about 3,400, in all warm and temperate regions, rare in arctic or alpine areas.

Tribe **Ajugoideae**: Calyx 10- or irregularly many-nerved, equally 5-toothed, or with the uppermost tooth largest, sometimes 2-lipped, with entire lips; corolla, in the South African genera, 1-lipped, or with a very short upper lip or a relatively large lower lip; stamens 4, more rarely 2, the lower pair longer, all ascending; anthers 2-theous, with the thecae parallel, divergent, or divaricate, sometimes confluent; ovary shortly 4-lobed, or lobed to the middle; nutlets with an oblique or lateral, usually large, areole (genera 1-3).

Tribe **Nepeteae**: Calyx usually 15-nerved, equal or often oblique, 5-toothed or somewhat 2-lipped; upper teeth usually the largest; corolla 2-lipped; lips rather large, the upper concave; stamens 4 (rarely 2), the upper pair longer, all ascending under the upper lip or sometimes divergent; anthers 2-theous; thecae more or less divaricate, sometimes parallel (genus 5).

Tribe **Stachydeae**: Calyx 5-10-nerved, equally or unequally 5-10-toothed (rarely many-toothed), rarely somewhat 2-lipped; corolla 2-lipped; lips usually large, the upper erect and usually concave; stamens 4, the lower pair longer, all ascending under the upper lip or sometimes included in the tube; anthers 2-theous or rarely 1-theous, with the thecae divergent or divaricate or confluent, sometimes parallel (genus 4 and genera 6-10).

Tribe **Monardeae**: Calyx usually 2-lipped, more rarely sub-equally lobed; corolla 2-lipped; lips often large, the upper concave; stamens 2, ascending under the upper lip; anthers often with a long connective bearing 1 or 2 (sometimes 1 perfect and the other imperfect) more or less widely separated oblong or linear thecae (genus 11).

Tribe **Saturineae**: Calyx 5-10- (sometimes 13-, rarely 15-) nerved, sub-equally or unequally 4-5-lobed, or 2-lipped; lobes or lips usually very small and flat; stamens (in the South African genera) 4, equal, or the lower pair longer, distant, divergent or ascending under the upper lip; anthers 2-theous, or 1-theous by confluence of the thecae at the apex (genera 12-13).

Tribe **Ocimoideae**: Calyx equally or unequally 3-5-toothed, with the upper tooth often much larger than the others and sometimes decurrent on the tube; corolla 2-lipped, oblique or nearly regular; upper lip flattish or not hooded; stamens 4, absent or rudimentary in female flowers, in pairs and all directed upon the lower side or lip of the corolla, or about equally spreading, never all ascending; anthers perfectly or imperfectly 1-theous by the confluence of the thecae at the apex (genera 14-27).

1. Flowers unisexual; ovary apparently perfect in the male flowers, but never producing seed; stamens in the female flower 0, or 4 and abortive **21. Iboza, N.E.Br.**
- Flower bisexual **2**
2. Fertile stamens 2; the upper pair reduced to staminodes, or wanting **3**
- Fertile stamens 4 **4**
3. Upper lip of corolla 3-lobed; connective not separated **20. Hoslundia, Vahl.**
Upper lip of corolla entire, emarginate; the connective of the anthers separated into an upper portion bearing a perfect theca and a lower portion barren or bearing a small or empty theca . . . **11. Salvia, Linn.**
4. Corolla 4-lobed **5**
- Corolla usually 2-lipped, more rarely 5-lobed or appearing 1-lipped . . . **6**
5. Calyx sub-equally 5-toothed; the uppermost tooth larger than the others; tube not many-nerved **16. Endostemon, N.E.Br.**
- Calyx equally 5-toothed or slightly 2-lipped, 10-13-nerved

13. Mentha, Linn.

6. Corolla 5-lobed, apparently with only 1 (the lower) lip **2. Teucrium**, *Linn.*
Corolla distinctly 2-lipped, or 5-lobed and slightly 2-lipped . . . 7
7. Upper lip of corolla 3-4-lobed, rarely 4-toothed . . . 8
Upper lip of corolla entire, emarginate, bifid, rarely 2-lobed, or corolla
5-lobed and sub-2-lipped . . . 17
8. Calyx 2-lipped or more or less truncate . . . 9
Calyx equally or unequally 5-toothed, rarely 10 to many-toothed
or 4-toothed . . . 11
9. Upper lip or tooth decurrent on the calyx-tube; inflorescence ter-
minal, spike-like, with distant or crowded flower-whorls
25. Becium, *Lindl.*
Upper calyx-tooth or -lip not decurrent on the tube; inflorescence a
lax panicle or raceme of cymes . . . 10
10. Calyx 5-toothed; teeth sub-equal or the uppermost the widest
18. Plectranthus, *L'Her.*
Calyx truncate or obscurely 2-lipped . . . **15. Aeginthus**, *Mart.*
11. Upper calyx-tooth evidently larger than the others . . . 12
Calyx-teeth equal or sub-equal . . . 15
12. Upper pair of filaments abruptly bent near the base, with a crest,
tuft of hairs, or retorse processes at the base . . . **24. Ocimum**, *Linn.*
Filaments without processes . . . 13
13. Filaments shortly connate into a tube at the base; disc produced
into a gland on the lower side . . . **19. Coleus**, *Lour.*
Filaments free, or the lower pair sometimes connate; disc unequally
lobed or produced into a long gland . . . 14
14. Calyx unequally 5-toothed; the upper tooth much larger than the
others; disc usually unequally lobed . . . **26. Orthosiphon**, *Benth.*
Calyx 2-lipped; upper lip ovate, seldom resembling the teeth of the
lower lip, but if so broader and more distant; disc usually pro-
duced into a gland which is sometimes longer than the ovary
18. Plectranthus, *L'Her.*
15. Flowers in many-flowered whorls, arranged in a terminal spike-like
inflorescence . . . **23. Geniosporum**, *Wallich*
Flowers in cymes, racemes, or panicles, or in pairs, or 6-flowered
whorls arranged in a lax or dense panicle . . . 16
16. Lower pair of filaments united . . . **22. Syncolostemon**, *E.Mey.*
Filaments all free . . . **18. Plectranthus**, *L'Her.*
17. Corolla 5-lobed, sub-2-lipped; lower lobes abruptly deflexed
14. Hyptis, *Jacq.*
Corolla distinctly 2-lipped . . . 18
18. Style woolly near the apex . . . **4. Acrotome**, *Benth.*
Style glabrous . . . 19
19. Calyx 6-10-toothed, usually 10-15-nerved, sometimes some of teeth
minute or obsolete . . . 20
Calyx 5-toothed or 2-lipped . . . 22
20. Filaments bearded near the base; upper lip of corolla not with a
fringe of hairs within; middle lobe of lower lip emarginate or
crenate . . . **9. Ballota**, *Linn.*
Filaments glabrous; upper lip of corolla with a fringe of hairs within;
middle lobe of lower lip as long as or longer than the lateral lobes . . . 21
21. Upper lip of the corolla much longer than the lower lip **6. Leonotis**, *Pers.*
Upper lip of the corolla as long as or shorter than the lower lip
7. Leucas, *Burm.*
22. Calyx-teeth spinescent . . . **17. Pycnostachys**, *Hook.*
Calyx 2-lipped or 5-toothed; the teeth not spinescent . . . 23
23. Calyx distinctly 2-lipped . . . 24
Calyx 5-toothed, rarely sub-2-lipped . . . 25
24. Upper calyx-lip decurrent on the tube; the lower lip sub-equally 4-
toothed . . . **27. Thunbergia**, *N.E.Br.*
Upper calyx-lip not decurrent; the lower lip entire or nearly so
3. Tinnea, *Peyr. & Kotschy*

25. The upper pair of stamens longer than the lower pair **5. Cedronella**, *Moench.*
The lower pair of stamens longer than the upper pair 26
26. Upper lip of corolla hairy within, if without a fringe then filaments
bearded at the base 27
Upper lip of corolla glabrous within 28
27. Filament bearded at the base **9. Ballota**, *Linn.*
Filaments glabrous **8. Lasiocorys**, *Benth.*
28. Calyx 13- (rarely 15-) nerved; stamens all ascending under the upper
lip **12. Micromeria**, *Benth.*
Calyx 5-10-nerved; stamens exserted 29
29. Lower corolla-lip about four times as long as the upper lip **1. Ajuga**, *Linn.*
Lower corolla-lip about twice as long as the upper lip **10. Stachys**, *Linn.*

7211

1. AJUGA, Linn.

Calyx 5-fid or 5-toothed; tube campanulate, 10 to irregularly many-nerved; teeth or lobes sub-equal. *Corolla* 2-lipped; tube included or exserted, annular-pilose inside, somewhat enlarged at the throat; upper lip short or very short, sub-entire, emarginate or 2-fid, sometimes truncate, sometimes thinly hairy; lower lip elongated, 3-lobed, with the middle lobe the largest and emarginate or 2-fid. *Stamens* 4, didynamous (the lower pair longer), usually exserted from the upper lip; anthers 2-theous, with the thecae divergent or divaricate, finally confluent. *Disc* equal, or often produced in front. *Ovary* shortly 4-lobed nearly to the middle; style 2-fid, with the lobes subulate and sub-equal. *Nutlets* obovoid, reticulate-rugose, attached by a broad lateral areole which extends beyond the middle.

Annual or more usually perennial herbs, rarely suffruticose at the base, often decumbent or stoloniferous; leaves often coarsely toothed, sometimes incised, rarely quite entire; floral leaves similar, or the upper (sometimes all) reduced to bracts; inflorescence a dense or interrupted terminal spike, or whorls 2 to many-flowered, axillary.

Species about 50, found chiefly in the extra-tropical regions of the Old World, most numerous in the Orient; 1 species in South Africa, extending from the Transvaal, the eastern Orange Free State, and Natal to the Uitenhage district; also recorded from the Somerset East district.

7212

2. TEUCRIUM, Linn.

Calyx 5-toothed, rarely inflated; tube tubular or campanulate; teeth equal or the uppermost broadest. *Corolla* 5-lobed, appearing one- (the lower) lipped; tube included or rarely exserted, naked inside; the lowermost lobe largest and often concave. *Stamens* 4, didynamous (the lower pair longer), exserted between the uppermost corolla-lobes; anthers 2-theous, with the thecae divergent or more usually divaricate, confluent. *Disc* equal. *Style* 2-fid, with the lobes subulate, sub-equal. *Nutlets* obovoid, reticulate-rugose, attached by an oblique or lateral areole which sometimes extends beyond the middle.

Herbs, undershrubs, or shrubs; leaves entire, toothed, or more or less deeply lobed, the upper similar or reduced to bracts; inflorescence a terminal spike, raceme, or head, or the whorls 2 to several-flowered, axillary.

Species about 180, widely distributed over the temperate and warmer regions of the world, but chiefly in the northern hemisphere and most frequent in the Mediterranean Region; 3 species in South Africa, extending from the Transvaal and Natal to the George district; also found in some central districts.

7213

3. TINNEA, Peyr. & Kotsch.

Calyx 2-lipped, much enlarged, inflated and deeply 2-valved when in fruit; tube campanulate; lips broad, entire, or nearly entire. *Corolla* 2-lipped;

tube short, broad, enlarged at the throat, scarcely longer than the calyx ; upper lip short, broad, emarginate or 2-lobed ; lower lip much larger, 3-lobed, with the middle lobe much larger than the other two. *Stamens* 4, didynamous (the lower pair longer), hairy at the base, ascending under the upper lip, more rarely somewhat exserted ; anthers 2-theous, with the thecae short divergent finally sub-confluent. *Disc* equal. *Ovary* shortly 4-lobed ; style shortly bifid. *Nutlets* obovoid-clavate, long-contracted at the base, attached by a lateral areole, furnished on the back with a broad membranous elliptic or orbicular wing. *Seeds* attached laterally.

Shrubs or perennial herbs, pubescent or grey-tomentose ; leaves sessile or petiolate, usually entire ; the upper similar or gradually reduced to bracts ; inflorescence a terminal raceme, or the whorls usually loosely 2-flowered, axillary.

An African genus of about 20 species, with 1 extending into Arabia ; 1 species in South Africa, recorded from the Transvaal.

7236

4. ACROTOME, Benth.

Calyx 5-11-toothed, more or less enlarged in fruit ; tube tubular-campanulate, 10-11-nerved. *Corolla* 2-lipped ; tube as long as the calyx or exserted, exannulate inside ; upper lip erect, slightly arched, entire or emarginate, hairy without, without an inner marginal fringe ; lower lip spreading, 3-lobed, with the middle lobe largest. *Stamens* 4, didynamous, included ; the lower pair longer than the upper ; anthers 1-theous ; those of the upper stamens short ; those of the lower stamens twice as long. *Disc* equal. *Style* barbate at the apex, almost entire or very shortly 2-fid. *Nutlets* 3-angled, truncate at the apex.

Herbs or undershrubs ; leaves entire or toothed ; the floral leaves similar to the others or gradually reduced in size ; flowers in few- or densely many-flowered whorls in the axils of the upper leaves.

An African genus of 6 species ; 4 species in South Africa, found in the northern Transvaal, Natal, Bechuanaland, South West Africa, and Namaqualand, and in a few of the north-eastern districts.

7245

5. CEDRONELLA, Moench.

Calyx 5-toothed ; tube tubular or campanulate, 13-15-nerved ; teeth equal. *Corolla* 2-lipped ; tube exserted, enlarged at the throat, exannulate inside ; upper lip erect, somewhat flat, 2-fid or emarginate ; lower lip spreading, 3-fid, with the middle lobe the largest. *Stamens* 4, didynamous ; the upper pair longer than the lower, ascending under the upper lip or exserted ; anthers 2-theous, with the thecae parallel and distinct. *Disc* sub-equal. *Style* shortly 2-fid at the apex. *Nutlets* ovoid, smooth.

Herbs or shrubs ; leaves toothed, in 1 species 3-foliate ; the floral leaves reduced to bracts ; inflorescence a terminal spike or raceme ; flowers in few- or densely many-flowered whorls ; bracteoles small, setaceous.

Species about 12, chiefly natives of North and central America, with 1 species in Japan ; 1 species (introduced) in South Africa, recorded from the Cape and Caledon districts.

7264

6. LEONOTIS, Pers.

Calyx 8-10-toothed ; tube tubular, 10-nerved ; teeth often rigid and spinescent, rarely unarmed or obtuse, more or less unequal ; the uppermost usually much longer and broader than the others, sometimes all but the uppermost minute or obsolete. *Corolla* 2-lipped ; tube usually exserted,

cylindric or slightly enlarged above, naked or imperfectly annular-pilose inside ; upper lip erect, elongated, concave, densely villous, fringed within ; lower lip short, spreading, 3-lobed, with the middle lobe scarcely longer than the other two. *Stamens* 4, didynamous, ascending under the upper lip ; the lower pair longer than the upper ; anthers approximate in pairs, 2-theccous, with the thecae divaricate, sub-confluent. *Disc* equal. *Style* subulate at the apex, 2-lobed, with the upper lobe very short. *Nutlets* ovoid-triquetrous, obtuse or truncate at the apex, glabrous.

Herbs or shrubs ; leaves often ovate, sometimes oblong-lanceolate, toothed, usually petiolate ; floral leaves similar but smaller, often sessile ; flowers in dense many-flowered axillary whorls ; the whorls usually few or solitary near the ends of the stem or branches ; bracteoles numerous, subulate to narrowly lanceolate, often spinescent.

An African genus of about 32 species, with 1 species extending into tropical Asia and America ; 13 species in South Africa, fairly generally distributed.

7268

7. LEUCAS, Burm.

Calyx 6-10-toothed ; tube tubular or tubular-campanulate, rarely inflated, 10-nerved, teeth equal or unequal. *Corolla* 2-lipped ; tube included, annular-pilose or annular-papillose inside, or sometimes naked ; upper lip erect, concave, entire, or more rarely emarginate, villous, fringed within ; lower lip spreading, 3-lobed, with the middle lobe the longest. *Stamens* 4, didynamous ; lower pair longer than the upper ; all (or at least the longer pair) exerted and ascending under the upper lip ; anthers approximate in pairs, 2-theccous, with the thecae divaricate, finally confluent. *Disc* equal and entire, or sinuate-toothed, or produced in front. *Style* subulate at the apex, with a very short posterior lobe. *Nutlets* ovoid-triquetrous, obtuse or scarcely truncate at the apex.

Annual or perennial herbs, or sometimes undershrubs, variously hairy, or rarely glabrescent ; leaves entire or toothed ; upper floral leaves similar to the others or reduced ; flowers in axillary few- or many-flowered whorls.

Species about 130, in the tropical regions of the Old World ; one in tropical America and the West Indies ; 5 species in South Africa, found in the Transvaal, Natal, the Orange Free State, Griqualand East, and in the Komgha district ; also recorded from Bechuanaland.

7268a

8. LASIOCORYS, Benth.

Calyx 5-toothed ; tube tubular-campanulate or campanulate, 10-nerved ; teeth ovate to narrowly deltoid, sometimes with 1 or 2 much smaller additional teeth. *Corolla* 2-lipped ; tube included or scarcely exerted, annular-pilose or annular-pappillose inside ; upper lip erect, concave, entire or emarginate, densely villous, fringed within ; lower lip spreading, 3-lobed, with the middle lobe broadest and emarginate. *Stamens* 4, didynamous (the lower pair longer), ascending under the upper lip ; anthers 2-theccous, with the thecae divaricate, finally confluent. *Disc* produced on the lower side into a gland as long as the ovary. *Style* subulate at the apex, with a shorter, sometimes minute, posticous lobe. *Nutlets* ovoid-triquetrous, rounded at the apex.

Branched shrubs or undershrubs ; leaves entire or toothed ; the upper similar to the others or reduced ; flowers in axillary few- or many-flowered whorls ; bracts subulate, very small.

Species 9, natives of Africa, Arabia, and Socotra ; 1 species in South Africa, widely spread.

7279

9. **BALLOTA**, Linn.

Calyx 5-10-, sometimes many-toothed; tube funnel-shaped. *Corolla* 2-lipped; tube sub-included, annular-pilose within; upper lip erect, sub-concave, emarginate or bifid, pubescent or villous; lower lip 3-lobed, with the middle lobe emarginate or crenate. *Stamens* 4, didynamous (lower pair the longer), ascending under the upper lip; filaments bearded; anthers approximate in pairs, 2-thecous, with the thecae finally divaricate, scarcely confluent. *Disc* equal, entire, or sinuate-dentate, or produced in front. *Style* 2-fid, with subulate sub-equal lobes. *Nutlets* ovoid-oblong, obtuse, smooth.

Perennial herbs, or more rarely undershrubs, hirsute, woolly, or tomentose; leaves often rugose, toothed; the upper similar but smaller; flowers in axillary many- or rarely few-flowered whorls; bracteoles subulate or oblong, sometimes spinescent or very small.

Species about 33, found chiefly in the Mediterranean Region and in the Orient, and widely spread in Europe; 1 in Central Asia; 1 in Malaya, and 2 in tropical Africa; 1 species in South Africa, found in the coastal districts from Namaqualand to the Albany district; also in several central districts.

7281

10. **STACHYS**, Linn.

Calyx 5-toothed, rarely more or less distinctly 2-lipped; tube tubular-campanulate, campanulate, or sometimes funnel-shaped, 5- or 10-nerved; teeth sub-equal. *Corolla* 2-lipped; tube cylindric to narrowly funnel-shaped, often enlarged at the mouth, included or exserted, naked or more or less annular-pilose inside; upper lip erect or ascending, usually concave or arched, entire or very shortly emarginate, sometimes thinly hairy; lower lip spreading or deflexed, 3-lobed. *Stamens* 4, didynamous (the lower pair longer), ascending under the upper lip, more or less exserted from the corolla-tube; anthers 2-thecous, with the thecae distinct parallel or usually divergent and at length divaricate. *Disc* usually equal. *Style* sub-equally bifid at the apex. *Nutlets* ovoid, or oblong in outline, obtuse or rounded at the apex.

Annual or perennial herbs, undershrubs, or sometimes shrubs, with various kinds of indumentum, or sometimes nearly glabrous; leaves sessile or petiolate, entire or toothed; the upper often reduced to bracts; inflorescence a terminal spike, or raceme, or flowers in 2 to many-flowered whorls (rarely reduced to 1 flower) axillary.

Species about 320, most frequent in the temperate regions of both hemispheres; 57 species in South Africa, widely distributed.

7290

11. **SALVIA**, Linn.

Calyx 2-lipped; tube ovoid, tubular, or campanulate; upper lip entire or 3-toothed; lower lip bifid. *Corolla* 2-lipped; tube ventricose or enlarged above, naked or annular-pilose inside; upper lip erect or falcate, usually concave, entire or emarginate; lower lip spreading, 3-lobed. *Stamens* 2, curved; the connective jointed to the filament, with the upper part ascending and bearing an oblong or linear perfect anther-theca and the lower part deflexed and horizontal and bearing a smaller polliniferous or empty anther-theca, or quite naked; staminodes 2, very small, or wanting. *Disc* usually more prominent on the lower side. *Style* shortly 2-fid at the apex. *Nutlets* triquetrous or somewhat compressed, smooth.

Herbs, undershrubs, or shrubs; leaves entire, toothed, or more or less deeply lobed; bracts small or large, rarely similar to the upper leaves; inflorescence a spike, raceme, or panicle; flowers in whorls of 2 to many.

Species about 700, widely dispersed in the temperate and tropical regions of both hemispheres; 38 species in South Africa, widely distributed.

7305

12. MICROMERIA, Benth.

Calyx 5-toothed or scarcely 2-lipped; tube tubular or tubular-campanulate, 13-15-nerved; teeth sub-equal. *Corolla* 2-lipped; tube shorter than the calyx or exserted; upper limb erect, nearly flat, entire or emarginate; lower lobe spreading, 3-lobed. *Stamens* 4, didynamous (lower pair the longer), ascending, arcuate-connivent at the apex, shorter than the corolla, or less frequently exserted and divaricate at the apex; anthers 2-theccous, with the thecae distinct parallel or divergent or divaricate. *Disc* equal, or reduced to a gland. *Style* bifid at the apex, with the lobes equal or unequal. *Nutlets* ovoid, or oblong in outline, smooth.

Herbs or undershrubs; leaves usually small, entire or toothed; inflorescence a terminal spicate panicle, or the whorls of flowers axillary.

Species about 60, widely spread in both hemispheres; 2 species in South Africa, extending from the Transvaal and Natal to Tembuland; also found in the eastern O.F.S.

7328

13. MENTHA, Linn.

Calyx 5-toothed, equal or sub-2-lipped; tube tubular or campanulate, 10-13-nerved. *Corolla* 4-lobed; tube funnel-shaped; lobes sub-equal, or the upper rather broader entire or emarginate. *Stamens* 4; anthers 2-theccous. *Disc* equal, sub-entire. *Style* shortly 2-fid at the apex. *Nutlets* ovoid, smooth.

Herbs; leaves opposite, usually toothed; inflorescence in spike-like racemes of whorled flowers, or the flower-whorls dispersed and axillary; floral leaves reduced to small bracts; bracteoles usually small, or obsolete.

Species about 20-30, distributed throughout the world, but more prevalent in temperate regions; 3 species in South Africa, fairly generally distributed.

7342

14. HYPTIS, Jacq.

Calyx 5-toothed, more or less accrescent in fruit; tube ovoid-campanulate or tubular; teeth subulate, sub-equal. *Corolla* 5-lobed, sub-2-lipped; tube cylindric or slightly ventricose, equal or slightly enlarged in the throat; upper lobes flat, erect, or spreading; lateral lobes usually similar; lower lobe (lip) saccate, abruptly deflexed in flower, entire or emarginate. *Stamens* 4, didynamous, declinate; anthers 1-theccous. *Disc* entire, or swollen in front into a short gland. *Style* shortly 2-fid or entire at the apex. *Nutlets* ovoid, or oblong in outline, smooth or punctate-rugose, in a few species surrounded by a membranous wing.

Annual or perennial herbs or shrubs; inflorescence various.

Species about 250, all American; 1 species in South Africa, found in the Transvaal and Natal.

7345

15. AEOLANTHUS, Mart.

Calyx truncate or obscurely 2-lipped, finally circumscissile near the base, usually accrescent in fruit; tube ovoid, campanulate, or tubular. *Corolla* 2-lipped; tube exserted, straight or decurved; upper lip obscurely 4-toothed; lower lip larger than the upper, concave, entire. *Stamens* 4, didynamous; anthers 1-theccous. *Disc* glandular. *Style* shortly 2-fid, with subulate arms. *Nutlets* rotundate, or oblong in outline, compressed, smooth.

Annual or perennial herbs, or small shrubs; leaves usually fleshy; inflorescence a lax panicle of cymes; bracts small, caducous.

An African genus of about 50 species; 3 species in South Africa, found in the Transvaal, Natal, Pondoland and the Graaff-Reinet district.

7345a

16. ENDOSTEMON, N.E.Br.

Calyx unequally 5-toothed; tube tubular-campanulate; upper tooth sub-orbicular, slightly decurrent on the tube; lateral and lower teeth narrowly deltoid-attenuate or deltoid-subulate. *Corolla* shortly 4-lobed; tube exerted from the calyx, straight or nearly so, slightly oblique at the mouth; the upper and lower lobes sub-equal and larger than the lateral lobes; all flat, or the lower one slightly concave. *Stamens* 4, in 2 pairs, inserted on the lower side of the corolla-tube, included; anthers imperfectly 1-theous. *Disc* indistinctly lobed. *Ovary* 4-lobed to the base; style abruptly enlarged at the base between the lobes of the ovary; stigma at first oblong-clavate and finally bifid. *Nutlets* oblong in outline, 3-angled, truncate at the apex.

A branching herb; leaves opposite; inflorescence a panicle of racemes; flowers whorled.

Species 1, found in the Transvaal, Natal, and Pondoland; also occurs in tropical Africa.

7347

17. PYCNOSTACHYS, Hook.

Calyx 5-toothed; tube ovoid-campanulate, slightly accrescent in fruit; teeth equal, subulate, rigid, sub-spinescent. *Corolla* 2-lipped; tube exerted beyond the calyx, deflexed, enlarged in the throat; upper lip entire, concave, longer than the upper lip. *Stamens* 4, didynamous, directed towards the lower lip of the corolla, sometimes joined at the base. *Disc* sub-equal. *Style* very shortly 2-fid at the apex. *Nutlets* sub-rotund, smooth.

Perennial erect herbs; leaves opposite or whorled; inflorescence a dense terminal spike; bracts shorter or longer than the calyx.

An African genus of about 40 species; 3 species in South Africa, found in the Transvaal, the eastern O.F.S., Natal, and Griqualand East.

7350

18. PLECTRANTHUS, L'Her.

Calyx 5-toothed, usually 2-lipped; teeth sub-equal, or the uppermost widest. *Corolla* 2-lipped; tube exerted beyond the calyx; upper lip 3-4-fid; lower lip usually much longer than the upper, entire, boat-shaped. *Stamens* 4, didynamous, directed towards the lower lip of the corolla; filaments all free. *Disc* usually produced into a gland in front which is sometimes longer than the 4-partite ovary. *Style* sub-equally 2-fid. *Nutlets* ovoid, or oblong in outline, smooth, granulate, or punctate.

Annual or perennial herbs or undershrubs; inflorescence a lax paniculate or racemose cyme; bracts usually small, leaf-like.

Species about 250, natives of Africa, India, China, Japan, the Malay Archipelago, Australia, and Polynesia; 42 species in South Africa, extending from the Transvaal and Natal through the coastal districts to Knysna; rare in the southwestern districts.

7355

19. COLEUS, Lour.

Calyx 5-toothed; upper tooth ovate, broader than the others; two lower teeth acute, often connate beyond the middle. *Corolla* 2-lipped; tube much longer than the calyx, usually deflexed about the middle; upper lip 3-4-lobed; the lower lip oblong, deeply concave. *Stamens* 4, didynamous; filaments shortly connate into a tube at the base. *Disc* produced into a gland on the lower side of the ovary. *Style* equally 2-fid at the apex. *Nutlets* ovoid or sub-globose, smooth.

Annual or perennial herbs, shrubs, or undershrubs; leaves sessile or petiolate; inflorescence a spike, raceme, or sub-panicle.

Species about 150, natives of Africa, the Mascarene Islands, India, China, the Malay Archipelago, Australia, and Polynesia; 2 species in South Africa, found in the Transvaal, Natal, the Peddie and East London districts.

7357

20. HOSLUNDIA, Vahl.

Calyx 5-toothed, becoming much enlarged and fleshy in fruit; teeth sub-equal. *Corolla* 2-lipped, exceeding the calyx; upper lip 3-lobed; lower lip concave, entire. *Stamens* 4; upper pair reduced to staminodes, with very rudimentary anthers; lower pair fertile, with rather large reniform 1-theous anthers. *Disc* small, crenate. *Ovary* 4-partite; style incurved and minutely 2-lobed at the apex. *Nutlets* enclosed in the fleshy calyx, dorsally compressed; testa thick and slightly mucilaginous.

Herbs or small shrubs; leaves opposite or whorled; inflorescence a terminal panicle, with the primary branches simple or branched; fruit berry-like.

An African genus of 3 species; 1 species recorded from the Transvaal.

7357a

21. IBOZA, N.E.Br.

Plants dioecious. *Flowers* very small, the male larger than the female and having an abortive ovary or style. *Calyx* minute, similar in both sexes, 3-lobed to the middle, or unequally or sub-equally 5-lobed; tube campanulate; the uppermost lobe ovate to sub-orbicular, usually not or but slightly larger than the others; lateral lobes minutely bifid or emarginate at the apex, or unequally or sub-equally 5-lobed, 5-nerved. *Corolla* very small, similar in both sexes, but larger in the male, 5-(rarely 4-) lobed; lobes sub-equal or unequal. *Stamens* in the male flower 4, exerted; anthers 1-theous; in the female flower 0, or 4 and abortive. *Disc* unequally 4-lobed or minute. *Ovary* 4-lobed, apparently perfect in the male flowers, but never producing seed and with the style sub-entire or bifid at the apex; in the female flowers stigmas oblong-linear. *Nutlets* erect, oblong in outline, or ovoid and dorsally compressed, obtuse or acute.

Stout perennial herbs; sometimes (at least as to dried specimens) nearly leafless at the time of flowering; leaves opposite, petiolate, ovate or cordate, toothed; inflorescence a large terminal much-branched panicle, with the ultimate branches laxly or densely spike-like and the separate whorls 6-flowered.

An African genus of 12 species; 5 species in South Africa, found in the Transvaal, the eastern Orange Free State, and Natal.

7359

22. SYNCOLOSTEMON, E.Mey.

Calyx sub-equally 5-toothed; the uppermost tooth scarcely broader than the others, not decurrent on the tube. *Corolla* 2-lipped, exerted from the calyx; upper lip unequally 3-lobed; lower lip concave or boat-shaped, entire, often reflexed. *Stamens* 4; upper pair of filaments free; lower pair of filaments united. *Disc* unequally lobed. *Ovary* 4-lobed; style minutely bifid at the apex. *Nutlets* erect, oblong in outline, obtuse, glabrous.

Herbs, or in 1 species shrubby; leaves opposite, simple, gland-dotted; inflorescence terminal, paniculate, lax or crowded into a dense mass; flowers in pairs or in 6-flowered whorls.

Endemic; species 7 extending from the Transvaal, Natal, and the Transkei to the East London district.

7363

23. GENIOSPORUM, Wallich

Calyx 4-5-toothed; tube elongating and cylindric in fruit, with prominent transverse veins on the upper part; in the 4-toothed plants, the 3 upper teeth sub-equal and smaller than the emarginate or minutely bifid lowest tooth; in the 5-toothed plants, the 3 upper teeth larger than the

other 2, or all the teeth sub-equal. *Corolla* 2-lipped, exserted from the calyx; tube short; upper lip shortly 4-lobed; lower lip boat-shaped. *Stamens* 4, directed towards the lower lip of the corolla; filaments bearded. *Style* bifid at the apex. *Nutlets* erect, oblong in outline, or ellipsoid.

Perennial herbs; leaves opposite; inflorescence terminal, spike-like, with the whorls many-flowered, usually crowded; flowers very small.

A genus of 16 or 17 species, natives of India, Madagascar, and Africa; 1 species in South Africa, found in the Transvaal and Swaziland.

7366

24. OCIMUM, Linn.

Calyx 5-toothed, deflexed in fruit; tube campanulate or tubular-campanulate; upper tooth much larger than the rest and more or less decurrent on the tube; the 4 lower teeth usually unequal. *Corolla* 2-lipped; tube about as long as the calyx-tube or shortly exserted; upper lip erect, 4-lobed; lower lip concave or nearly flat. *Stamens* 4, directed towards the lower lip, exserted; upper pair of filaments abruptly bent near the base, with a crest, tuft of hairs, or retorse process at the knee. *Disc* 1-4-lobed. *Style* shortly bifid at the apex. *Nutlets* oblong in outline, ellipsoid or sub-globose, glabrous.

Herbs or small shrubs; leaves opposite, simple, gland-dotted; inflorescence terminal, spike-like; flowers in whorls of 6.

Species many, distributed throughout the warmer regions of the earth; 5 species in South Africa, found in the Transvaal, Natal, Griqualand West, Bechuanaland, and S.W. Africa; also recorded from the Komgha district.

7366a

25. BECIUM, Lindl.

Calyx 3-(rarely 5-) toothed, 2-lipped; upper lip or tooth broadly ovate, decurrent on the tube; lower lip formed by the oblique or truncate ciliated or denticulate mouth of the tube and 2 subulate or bristle-like teeth; lateral teeth none or rarely developed. *Corolla* 2-lipped; tube exserted beyond the calyx-teeth or about equalling them; upper lip 4-lobed, erect; lower lip concave or boat-shaped. *Stamens* 4, directed towards the lower lip, exserted; filaments all free; the upper pair abruptly bent or kneeed and toothed or crested near the base. *Ovary* 4-lobed; stigma bifid. *Nutlets* ellipsoid, or oblong in outline, slightly compressed dorsally, glabrous.

Herbs or small shrubs; leaves opposite or fascicled, simple, gland-dotted; inflorescence terminal, spike-like, with distant or crowded flower-whorls.

Species several, natives of Africa, India, and Arabia; 3 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district; also found in a few central districts and the eastern portion of the O.F.S.

7367

26. ORTHOSIPHON, Benth.

(*Hemizygia*, Br'q.)

Calyx unequally 5-toothed; tube campanulate or tubular-campanulate; the upper tooth much larger than the others, sometimes decurrent on the tube. *Corolla* distinctly 2-lipped; tube usually much exserted beyond the calyx-teeth, rarely about equalling them; upper lip shortly 3-4-lobed; lower lip very concave or boat-shaped. *Stamens* 4, exserted, directed towards the lower lip of the corolla; upper pair inserted at various heights on the corolla-tube, very rarely knee-bent near the base; lower pair free or variably united, inserted at or just below the lower lip. *Disc* usually unequally lobed. *Ovary* deeply 4-lobed; style exserted, minutely bifid, sub-entire, or divided into 2 short filiform or subulate lobes. *Nutlets* oblong in outline, ellipsoid, or sub-orbicular, usually slightly compressed dorsally.

Herbs, perennial or annual; leaves opposite or rarely whorled, gland-dotted; inflorescence terminal, simple or branched, sometimes with 2 or more pairs of flowerless coloured bracts at the apex; flower-whorls separate, 2-6-flowered.

Species over 100, natives of Africa, Madagascar, Socotra, Arabia, India, the Malay Archipelago, and Australia; 30 species in South Africa, found in the Transvaal, the eastern Orange Free State, and Natal and as far as the Kat Berg; also recorded from Bechuanaland.

7367a

27. THORNCROFTIA, N.E.Br.

Calyx campanulate, 2-lipped, horizontal in fruit; the upper lip ovate, acute, decurrent on the tube; the lower lip sub-equally 4-toothed, with the teeth narrow deltoid and acute. *Corolla* 2-lipped; tube long exserted, straight, cylindric; the upper lip cuneate-oblong, emarginate at the apex; the lower lip 3-partite from the base, with the lateral segments linear-lanceolate, sub-acute, and the middle segment concave, obtuse. *Stamens* 4, didynamous, declinate, inserted in the throat of the corolla-tube, free, exserted; anthers 1-theous. *Disc* small; swollen into a gland in front. *Style* equally bifid. *Nutlets* sub-ellipsoid, slightly corrugated at the apex.

Herbs; leaves opposite, petioled, small; inflorescence a panicle; flowers opposite, pedicelled.

Endemic; species 1, found in the Barberton district of the Transvaal.

162. SOLANACEÆ.

Flowers bisexual, regular, or slightly irregular. *Calyx* 4-5- (rarely 6-7-) toothed or lobed; lobes imbricate or valvate. *Corolla* tubular, funnel-shaped, campanulate, or rotate, sometimes plicate; lobes 4-5 (rarely 6-7), induplicate-valvate in bud, spreading or more rarely erect, equal or sub-equal. *Stamens* as many as the corolla-lobes and alternating with them, rarely fewer, inserted on the corolla-tube; filaments short or long; anthers distinct or conniving into a cone; thecae parallel or diverging, dehiscing by terminal or oblique pores, or longitudinal slits. *Disc* annular, entire, lobed, or absent. *Ovary* superior, sessile or shortly stipitate, 2-5-chambered, with numerous anatropous or amphitropous ovules in each chamber; style terminal, filiform; stigmas terminal, small or slightly expanded and bilamellate. *Fruit* a berry, or a capsule dehiscing by valves or circumscissile. *Seeds* numerous, small, with fleshy endosperm; embryo often terete, near the outside of the endosperm; cotyledons semi-terete, rarely wider than the radicle.

Herbs, erect or climbing shrubs, more rarely trees, glabrous, pubescent, or stellately tomentose, sometimes spiny; leaves alternate, geminate, or verticillate, entire or variously divided; inflorescence cymose, terminal, leaf-opposed or extra-axillary, sometimes appearing umbellate or fasciculate, or reduced to one flower.

Genera about 66; species about 1,400, very abundant in tropical and extra-tropical South America.

Tribe **Atropeae**: Corolla-lobes more or less imbricated; stamens all perfect; fruit a berry (genus 2).

Tribe **Solaneae**: Corolla-limb sub-equally plicate or divided into valvate or induplicate lobes; stamens all perfect; fruit a berry (genera 1, 3-5).

Tribe **Hyoscyameae**: Corolla-lobes plicate or imbricate; stamens all perfect; fruit a capsule (genus 6).

Tribe **Cestrineae**: Corolla-tube cylindric or widened above; lobes distinct, imbricate or induplicate-valvate; stamens all perfect; fruit a berry or often a capsule (genera 7-8).

- | | |
|--|------------------------------------|
| 1. Leaves verticillate | 8. <i>Retzia</i> , <i>Thunb.</i> |
| Leaves alternate or geminate | 2 |
| 2. Ovary 3-5-chambered | 3 |
| Ovary 2-chambered, rarely 3-4-chambered and then anthers dehiscing
by terminal pores | 4 |
| 3. Calyx enlarged after flowering and enveloping the fruit ; fruit a berry | 1. <i>Nicandra</i> , <i>Adans.</i> |
| Calyx deciduous, excepting the base ; fruit a capsule | 6. <i>Datura</i> , <i>Linn.</i> |
| 4. Fruit a capsule | 7. <i>Nicotiana</i> , <i>Linn.</i> |
| Fruit a berry | 5 |
| 5. Stamens inserted in the throat of the corolla-tube ; anthers dehiscing
by pores | 5. <i>Solanum</i> , <i>Linn.</i> |
| Stamens inserted on the corolla-tube or at base of the corolla-tube :
anthers dehiscing by longitudinal slits | 6 |
| 6. Calyx much enlarged in fruit | 7 |
| Calyx not or but slightly enlarged in fruit | 2. <i>Lycium</i> , <i>Linn.</i> |
| 7. A herb with solitary flowers | 4. <i>Physalis</i> , <i>Linn.</i> |
| A shrub with fasciated flowers | 3. <i>Withania</i> , <i>Pauq.</i> |

7377

1. NICANDRA, Adans.

Calyx 5-partite, much enlarged and inflated in the fruit, prominently 5-angled, scarious-membranous ; lobes cordate, sub-sagittate, wide, conniving, reticulate. *Corolla* widely campanulate ; limb very shortly or obscurely 5-lobed ; lobes or folds very narrowly imbricate. *Stamens* 5, inserted near the base of the corolla ; filaments dilated at the base into a pilose scale. *Ovary* 3-5-chambered, with many ovules in each chamber ; stigmas oblong or sub-globose, 3-5-partite, with conniving lobes. *Fruit* a globose berry, much shorter than the enlarged calyx. *Seeds* sub-orbicular, compressed, minutely scrobiculate.

An annual erect much-branched glabrous herb ; leaves petioled, coarsely sinuate-toothed or almost lobed ; flowers pedicelled, solitary.

Species 1, native of Peru, but now naturalised in most hot countries ; recorded in South Africa from the Transvaal and Natal.

7379

2. LYCIUM, Linn.

Calyx campanulate or tubular, truncate or irregularly 3-5-toothed, not or but slightly enlarged in the fruit. *Corolla* tubular, funnel-shaped, campanulate or urceolate ; tube short or long, often swollen at the throat ; lobes 4-5, flat, spreading, imbricate. *Stamens* 4-5, inserted in the corolla-tube, included or exerted ; filaments often dilated and hairy at the base. *Disc* annular or cupular. *Ovary* 2-chambered, with few or many ovules ; stigma capitate, or dilated and very shortly 2-lamellated. *Fruit* a globose ovoid or conical berry. *Seeds* many, rarely few or solitary, compressed.

Trees or shrubs ; ultimate branchlets often spiny ; leaves entire, linear and sub-terete, or flat, often in fascicles.

Species about 50, found in the temperate and warm regions throughout the world, very common in extra-tropical South America ; 18 species in South Africa, widely distributed, but not recorded from the Transvaal.

7400

3. WITHANIA, Pauq.

Calyx campanulate, 5-6-toothed, enlarged and inflated in the fruit. *Corolla* narrowly campanulate, 3-6-fid ; lobes valvate. *Stamens* inserted near the corolla-base. *Disc* annular, crenulate, or 0. *Ovary* 2-chambered, with many ovules in each chamber ; stigma shortly and widely 2-lamellate. *Fruit* a globose berry, shorter than the enlarged calyx. *Seeds* compressed.

Hoary shrubs, loosely tomentose, woolly, or glabrescent; leaves quite entire; flowers usually fascicled, sub-sessile or shortly pedicellate.

Species about 4, extending from southern Europe and western Asia, to north and tropical Africa and the Canary Islands; 1 species in South Africa, widely distributed.

7401

4. *PHYSALIS*, Linn.

Calyx campanulate or pyramidal, shortly 5-lobed, or lobed to the middle, enlarged and inflated and membranous in fruit, 5-angled or prominently 10-ribbed, often 5-auricled at the base. *Corolla* sub-rotate or very widely campanulate, 5-angled or shortly and widely 5-lobed. *Stamens* 5, inserted near the corolla-base; anthers erect, usually shorter than the filaments. *Ovary* 2-chambered, with numerous ovules in each chamber; stigma shortly 2-lobed. *Fruit* a globose berry, enclosed in and smaller than the inflated calyx. *Seeds* many or few, smooth or tuberculate-rugose, compressed.

Annual or perennial herbs, clothed with simple or stellate hairs; leaves entire, sinuate, or more rarely pinnatifid; flowers small, solitary, axillary, pedicellate, violet, yellow, or white, often purple at the base.

Species about 50, chiefly in the warmer parts of America; 3 species naturalised in South Africa.

7407

5. *SOLANUM*, Linn.

Calyx 5-10- (rarely 4-) toothed or lobed; tube campanulate or rotate. *Corolla* rotate, more rarely campanulate; limb plicate, more or less deeply 5- (rarely 4- or 6-) lobed. *Stamens* usually 5, rarely 6, inserted in the corolla-throat; filaments very short; anthers oblong or lanceolate, conniving or cohering in a cone, dehiscing by pores or longitudinal slits. *Disc* inconspicuous. *Ovary* usually 2- (rarely 3-4-) chambered, with numerous ovules in each chamber; style simple; stigma small, capitate. *Fruit* a globose berry, sometimes oblong in outline. *Seeds* compressed, orbicular or sub-reniform.

Shrubs, herbs, or small trees, sometimes climbing, unarmed or spiny; leaves alternate or geminate, entire, lobed, or pinnatisect; inflorescence an extra-axillary dichotomous racemose or umbellate cyme, sometimes a terminal panicle; flowers yellow, white, violet, or purple.

Species about 800, most abundant within the tropics, but extending into the temperate zone; 31 species in South Africa, widely distributed.

7415

6. *DATURA*, Linn.

Calyx long, tubular, 5-fid, or spathaceous, sometimes circumscissile near the base. *Corolla* funnel-shaped, enlarged at the throat; limb plicate; lobes 5, short, broad, usually acuminate. *Stamens* 5, inserted near the base of the corolla-tube, included; anthers sometimes cohering into a tube. *Ovary* 2-chambered, or more or less spuriously 4-chambered, with numerous ovules; style dilated and 2-lobed at the apex. *Fruit* a dry capsule, or with a somewhat fleshy pericarp, indehiscent or 4-valved, spiny or smooth. *Seeds* compressed.

Herbs, shrubs, or trees, glabrous or sparingly hairy; leaves large, entire, or coarsely toothed; flowers pedicelled, solitary, large, erect or pendulous.

Species about 12, widely dispersed through the temperate and warmer regions of both hemispheres; 2 species found as weeds in South Africa.

7434

7. NICOTIANA, Linn.

Calyx ovoid or tubular-campanulate, 5-fid. *Corolla* funnel- or salver-shaped ; tube long, cylindric or slightly ventricose ; limb equal or oblique ; lobes 5, spreading, induplicate. *Stamens* 5, inserted below the middle of the corolla-tube, included or exserted, more or less unequal ; anthers deeply 2-lobed. *Disc* present or 0. *Ovary* 2- (rarely 4 to many-) chambered, with numerous ovules ; stigma dilated, shortly and widely 2-lobed. *Fruit* a 2- (rarely 4-) locular capsule, dehiscing to the middle or lower by 2-fid valves. *Seeds* numerous, small, scarcely compressed, granular.

Herbs or sub-shrubs, rarely sub-arborescent, usually with glutinous hairs ; leaves simple, entire or sinuate ; inflorescence a unilateral bracteate or ebracteate raceme, rarely flowers solitary and axillary ; flowers white, yellow, greenish, or pink.

Species about 40 in extra-tropical North and South America, Australia, and the Pacific Islands ; 2 species in South Africa, 1 naturalised and 1 cultivated.

7456

8. RETZIA, Thunb.

Calyx narrow ; lobes 5, acute, unequal. *Corolla-tube* elongate, symmetrical ; lobes 5 (rarely 6-7), short, induplicate-valvate. *Stamens* inserted in the throat of the corolla-tube, as many as and shorter than the corolla-lobes ; anthers shortly sagittate. *Disc* very small. *Ovary* 2-chambered, with 2-3 ovules in each chamber ; stigma scarcely dilated. *Fruit* an oblong acuminate septicidal 2-valved capsule. *Seeds* few or solitary, oblong.

An erect rigid shrub ; young branches densely villous ; leaves verticillate, sessile, linear-lanceolate, entire ; flowers several at the end of the stem.

Endemic ; species 1, recorded from the Stellenbosch and Caledon districts.

163. SCROPHULARIACEÆ.*

Flowers bisexual, usually irregular. *Sepals* 4-5, or rarely calyx spathaceous or 3-partite. *Corolla* gamopetalous, often more or less 2-lipped ; lobes 4-5, very rarely 6, rarely the corolla split open in front ; tube various, sometimes spurred, or gibbous, or with pouches ; the throat naked, or sometimes bearded, or with a palate ; lobes equal or unequal, or corolla bilabiate, with the posterior lobes or upper lip overlapping the lateral lobes, or overlapped by the lateral lobes in the bud. *Stamens* usually 4, and didynamous, sometimes 2 or 5, exserted or included, inserted at the base of the corolla, on the corolla-tube, or in the corolla-throat and alternating with the lobes ; filaments glabrous or hairy, often unequal ; anthers 2-theous or 1-theous, very rarely only one theca of the anther developed, all perfect, or sometimes some of the anthers absent or abortive, or only one theca fertile. *Ovary* superior, usually 2-chambered, very rarely 3-chambered or imperfectly 1-chambered ; ovules numerous, many, few, or only one in each chamber ; style straight or variously curved at the apex ; stigma various. *Fruit* usually a loculicidal or septicidal capsule, rarely a berry, more rarely splitting into two 1-seeded cocci.

Annual or perennial herbs or small shrubs, rarely large shrubs or moderate-sized trees, often heath-like ; leaves opposite, alternate, or verticillate, rarely radical ; stipules 0 ; inflorescence various or flowers solitary.

Genera about 170, with over 2,000 species, found in Africa, a few in Madagascar and Australia ; many cosmopolitan in temperate regions.

*Hutchinson "Families of Flowering Plants" places the *Scrophulariaceae* under the Order *Personales* and the Family *Selaginaceae* (here represented by the Tribe *Selaginaceae*) under the Order *Lamiales*.

- Tribe **Verbasceæ** : Leaves all alternate ; corolla rotate or shortly campanulate ; tube very short or nearly obsolete ; 2 posterior lobes of the limb exterior in bud ; capsule septicidally bivalved (genus 1).
- Tribe **Aptosimeæ** : Leaves all alternate or very rarely opposite ; corolla-tube widened into a long throat ; 2 posterior lobes of the limb exterior in bud ; capsule septicidally bivalved (genera 2-4).
- Tribe **Hemimerideæ** : Leaves (at least the lower) opposite ; corolla-tube very short or nearly obsolete ; 2 posterior lobes exterior in bud, resupinate or bifoveolate, bisaccate or bicalcarate at the base ; capsule septicidal (genera 5-7).
- Tribe **Antirrhineæ** : Leaves (at least the lower) opposite or alternate ; corolla-tube long or not very short, sacculate, foveolate, or spurred at the base ; 2 posterior lobes of the limb exterior in bud ; capsule septicidal, or loculicidal, or dehiscing by pores or slits from or near the apex (genera 8-12).
- Tribe **Cheloneæ** : Shrubs, more or less robust, or trees ; leaves (at least the lower) opposite or verticillate ; corolla without any pocket or spur at the base ; 2 posterior lobes exterior in bud ; fruit capsular and septicidal, or fleshy and indehiscent (genera 13-21).
- Tribe **Nemesiæ** : Herbs or undershrubs ; leaves (at least the lower) opposite or rosulate ; corolla without any pocket or spur at the base ; 2 posterior lobes exterior in bud ; anther-thecae confluent ; capsule septicidal (genera 22-26).
- Tribe **Gratiolæ** : Herbs ; leaves (at least the lower) opposite ; corolla-tube not very short, without any pocket or spur at the base ; 2 posterior lobes exterior in bud ; anther-thecae 2, distinct or confluent at the apex ; fruit capsular, loculicidal, or septicidal, or indehiscent (genera 27-32).
- Tribe **Selaginæ** : Herbs or shrubs ; leaves alternate, rarely the lower opposite ; corolla often bilabiate and the tube slit down one side ; ovary with a single ovule in each chamber ; fruit indehiscent, or dehiscing into two 1-seeded nuts (genera 33-39).
- Tribe **Digitaleæ** : Leaves alternate or opposite ; corolla-lobes flat, spreading, or the upper sub-erect ; the posterior lobe interior in bud (genera 40-41).
- Tribe **Gerardiæ** : Leaves opposite (at least the lower ones), or rarely alternate ; corolla-lobes flat, more or less spreading ; 1 or both posterior lobes interior in bud ; herbs, mostly parasitic or semi-parasitic (genera 42-53).
- Tribe **Euphrasiæ** : Leaves opposite ; corolla bilabiate, neither spurred nor saccate at the base ; posterior lip erect, galeate, interior in bud ; stamens 4, didynamous, ascending against the posterior lip of the corolla ; anthers 2-thealous ; capsule loculicidal (genus 54).
1. Posterior lobes or upper lip of the corolla overlapping the lateral lobes in the bud 2
 - Posterior lobes or upper lip of the corolla overlapped in the bud by one or both of the lateral lobes 43
 2. Ovary 2-chambered, very rarely 3-chambered, with numerous ovules (rarely several or few) 3
 - Ovary 2-chambered, with a single pendulous ovule in each chamber 37
 3. Fruit a berry 4
 - Fruit a capsule 6
 4. Stamens 5 ; epiphytic plants 13. *Dermatobotrys*, *Bolus*
 - Stamens 4 ; shrubs or small trees 5
 5. Corolla-tube bearded and marked with 5 spots at the apex ; anther-thecae distinct, parallel 15. *Teedia*, *Rudolphi*
 - Corolla-tube not bearded ; anther-thecae diverging, at length divaricate 14. *Halleria*, *Linn.*
 6. Stamens 5 1. *Verbascum*, *Linn.*
 - Stamens 2 or 4, sometimes with a rudimentary fifth 7
 7. Stamens 2 8
 - Stamens 4, often only 2 fertile 11
 8. Corolla bilabiate 9
 - Corolla 4-5-lobed or cleft, not bilabiate 10
 9. Leaves whorled ; stamens inserted at the base of the corolla 19. *Ixianthes*, *Benth.*
 - Leaves opposite ; stamens inserted on the upper part of the corolla-tube 32. *Ilysanthes*, *Rafin*

10. Corolla-tube very short, with 2 spurs or small pouches at the base
 Corolla-tube exceeding the calyx, without any spurs, or pouches
 7. *Hemimeris*, *Thunb.*
 2. *Anticharis*, *Endl.*
11. Corolla with pits, pouches, spurs, or gibbous 12
 Corolla without any pits, pouches, spurs, not gibbous 18
12. Corolla bilabiate: usually herbaceous plants 13
 Corolla 5-lobed; lobes nearly equal; a much-branched shrub
 8. *Colpias*, *E.Mey.*
13. Fertile stamens 2 6. *Diascia*, *Link & Otto.*
 Fertile stamens 4 14
14. Corolla without a palate in the throat 15
 Corolla with a palate in the throat 16
15. Corolla produced into a dependent spur 10. *Diclis*, *Benth.*
 Corolla produced into 2 pits, spurs, or pouches, these very rarely
 absent, or corolla with a single broad shallow pouch 6. *Diascia*, *Link*
16. Corolla-tube very short; posterior lip 4-cleft; anther-thecae
 confluent, hence apparently 1-thecous 9. *Nemesia*, *Vent.*
 Corolla-tube not very short; posterior lip bilobed; anther-thecae
 distinct 17
17. Corolla-tube produced into a long spur 11. *Linaria*, *Juss.*
 Corolla-tube saccate or gibbous at the base 12. *Antirrhinum*, *Tourn.*
18. Leaves verticillate, mostly ternate; shrubs or trees 21. *Bowkeria*, *Harv.*
 Leaves opposite or alternate, sometimes crowded and apparently
 verticillate, but then herbs or small undershrubs 19
19. Calyx 3-toothed 30. *Craterostigma*, *Hochst.*
 Calyx 5-toothed, -cleft, or -lobed 20
20. Aquatic or marsh plants 29. *Limosella*, *Linn.*
 Herbs, shrubs, or trees 21
21. Corolla-tube obsolete; the posterior lobes deeply cleft or separate
 almost to the base 5. *Alonsoa*, *Ruiz & Pavon.*
 Corolla-tube developed, usually exceeding the calyx, equally or
 sub-equally lobed or bilabiate 22
22. Corolla equally or sub-equally 5-lobed, if bilabiate then the posterior
 lip not 2-fid and the anterior lip 3-fid, but the lobes of both lips
 equal 23
 Corolla bilabiate; the upper lip 2-fid; the lower lip 3-fid 33
23. Robust shrubs or trees 24
 Herbaceous or low undershrubs 26
24. Anthers exerted beyond the corolla-tube 16. *Phygellus*, *E.Mey.*
 Anthers included within the corolla-tube 25
25. Leaves sessile, entire; anthers 2-thecous 17. *Freylinia*, *Pangellii*
 Leaves petioled, toothed; anthers 1-thecous 18. *Manuleopsis*, *Thell.*
26. Leaves all alternate or very rarely opposite; corolla-tube widened
 into a long throat; low shrubs or undershrubs, rarely erect herbs. 27
 Leaves (at least the lower) opposite or rosulate; corolla often
 bilabiate; herbs or shrubs 29
27. An erect herb; fertile stamens 2 2. *Anticharis*, *Endl.*
 Low or prostrate shrubs or undershrubs; stamens 4, all perfect.
 or the anthers of the posterior pair smaller and often empty 28
28. Fertile stamens 4 4. *Peliostomum*, *Benth.*
 Fertile stamens usually 2 3. *Aptosimum*, *Benth.*
29. Bracts distinctly or very shortly adnate to the calyx or pedicel.
 or to both, very rarely free, if so then calyx bipartite or bilabiate 30
 Bracts free from the calyx and pedicel 32
30. Calyx equally 5-cleft or 5-partite 24. *Phyllopodium*, *Benth.*
 Calyx bilabiate or bipartite 31
31. Anthers all alike 25. *Polycarena*, *Benth.*
 Anterior anthers differing from those of the posterior pair of stamens
 26. *Zaluzianskya*, *F. W. Schmidt*

32. Calyx surrounded by narrow bracts or without bracts ; inflorescence
a compound, rarely a simple, raceme **22. Manulea**, *Linn.*
Calyx usually surrounded by broad bracts ; flowers solitary, or
inflorescence usually a simple spike, raceme, or head **23. Sutura**, *Roth.*
33. A shrub or tree **20. Anastrabe**, *E.Mey.*
Herbs 34
34. Calyx bilabiate ; tube longitudinally ribbed and winged
31. **Torenia**, *Linn.*
Calyx 5-toothed, -cleft, or -partite 35
35. Flower pedicels bibracteolate near the top **28. Moniera**, *B.Juss.*
Flower pedicels without bracts 36
36. Stamens 2 or 4, but only 2 fertile **32. Ilysanthes**, *Rafin.*
Stamens 4, all fertile **27. Mimulus**, *Linn.*
37. Perfect stamens 2 ; staminodes sometimes present 38
Perfect stamens 4 39
38. Calyx 5-lobed nearly to the middle ; staminodes 2 **38. Gosela**, *Choisy*
Calyx shortly 5-toothed ; staminodes 0 **39. Agathelpis**, *Choisy*
39. Corolla split in front down to or below the middle of the tube ;
stamens inserted on the margins 40
Corolla not split in front ; stamens fixed at or near the corolla-throat 41
40. Calyx split open in front, entire or notched behind
33. **Hebenstreitia**, *Linn.*
Calyx divided into 2 narrow entire segments **34. Dischisma**, *Choisy.*
41. Calyx tripartite ; middle lobe usually smaller than the lateral,
occasionally wanting **36. Walafrida**, *E.Mey.*
Calyx equally or unequally 5-lobed, -partite, or -toothed 42
42. Bract free from the calyx **35. Selago**, *Linn.*
Bract adnate to the base of the calyx **37. Microdon**, *Choisy*
43. Calyx-segments glumaceous, lacinate or glandular-fimbriate at the
apex **41. Glumicalyx**, *Hiern*
Calyx-segments not glumaceous 44
44. Throat of the corolla bearded or with a palate ; corolla-tube as long
as or shorter than the calyx 45
Throat of the corolla naked, if shortly bearded then the corolla-tube
almost twice as long as the calyx 46
45. Calyx shortly 4-lobed ; corolla with a bigibbous palate
54. **Bellardia**, *All.*
Calyx deeply 5-cleft ; corolla with the throat bearded behind
42. **Charadrophila**, *Marl.*
46. One anther-theca only developed ; fleshy parasitic plants with
scale-like leaves **53. Hyobanche**, *Thunb.*
Both anther-thecae developed, but one sometimes rudimentary or
barren 47
47. Only one theca of each anther perfect and containing pollen, the
other theca empty 48
Both anther-thecae perfect and containing pollen 50
48. Parasitic herbs, with scale-like leaves ; calyx 5-lobed **52. Harveya**, *Hook.*
Erect rigid herbs or climbing shrubs ; calyx 4-5-cleft or -lobed 49
49. Corolla bilabiate **47. Sopubia**, *Hamilt.*
Corolla more or less equally 5-lobed **45. Buttonia**, *McKen*
50. Corolla bilabiate 51
Corolla 5-lobed 52
51. Style bent downwards or curved near the apex ; anther-thecae
distinct **43. Melasma**, *Berg.*
Style straight ; anther-thecae confluent **51. Striga**, *Lour.*
52. Style bent, curved, or arched near the apex ; filaments hairy, if
glabrous then calyx-tube angular or strongly nerved 53
Style straight ; filaments glabrous 55
53. Calyx foliaceous or sub-foliaceous ; the tube angular or strongly
nerved **43. Melasma**, *Berg.*
Calyx not foliaceous ; tube not angular nor strongly nerved 54

54. Teeth of calyx much shorter than the tube ; inflorescence a terminal raceme ; an erect herb **44. Gerardiina, Engl.**
Teeth of calyx equalling or longer than the tube ; flowers axillary ; undershrubs **46. Graderia, Benth.**
55. Stamens 2, exserted **40. Veronica, Linn.**
Stamens 4, included 56
56. Filaments hairy ; corolla sub-bilabiate **49. Cynium, E.Mey.**
Filaments glabrous ; corolla 5-lobed, more rarely 4-6-lobed ; lobes equal or unequal 57
57. Calyx 4-5-toothed ; tube 8-10-nerved, usually 5-10-ribbed **48. Buechnera, Linn.**
Calyx 5-cleft or deeply 5-lobed ; tubed not distinctly nerved nor ribbed **50. Rhamphicarpa, Benth.**

7460

1. VERBASCUM, Linn.

Calyx 5-partite or deeply 5-cleft, rarely shortly 5-lobed ; lobes imbricate. *Corolla* 5-lobed, rotate ; tube very short ; lobes slightly unequal, with the 2 posterior exterior. *Stamens* 5, all fertile, inserted at the base of the corolla-tube, some or all woolly-bearded ; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules ; style thickened towards the apex. *Fruit* a capsule, globular, or ovoid, or oblong in outline, septicidally bivalved, with the valves usually bifid. *Seeds* numerous, ovoid or oblong, wrinkled, not winged.

Robust herb, often clothed with woolly tomentum ; leaves alternate, entire, or toothed, or lobed ; inflorescence terminal, a raceme or spike, simple or branched ; pedicels usually short and without bracteoles, axillary, or fasciculate in the axils of bracts or floral leaves.

A large genus chiefly prevalent in the northern temperate regions of the Old World ; 1 species found in South Africa (round Cape Town) as an introduction ; as a garden escape it is found in several other localities.

7466

2. ANTICCHARIS, Endl.

Calyx herbaceous, 5-partite ; segments valvate or nearly so. *Corolla* 5-lobed, exceeding the calyx ; tube narrow in the lower part, dilated above into an elongated throat ; limb spreading, almost equally 5-cleft ; 2 posterior lobes exterior. *Stamens* 2-4, inserted above the base of the corolla ; the two anterior perfect, the other one or two (when present) shorter and without anthers ; anthers somewhat transverse, glabrous or somewhat pilose, with confluent thecae. *Ovary* 2-chambered, with numerous ovules ; style somewhat claviform towards the apex ; stigma obtuse, entire or emarginate. *Fruit* a capsule, ovoid, or oblong in outline, somewhat acutely pointed at the apex, dehiscent both loculicidally and septicidally. *Seeds* numerous, small, oblong or ovoid, striate-ribbed.

Small erect viscid-pubescent herbs ; leaves alternate, entire ; flowers axillary, solitary, shortly peduncled, purplish ; peduncles usually bibracteate.

Species about 9, natives of tropical Africa, Arabia, and eastern India ; 1 species in South Africa, recorded from Namaqualand.

7467

3. APTOSIMUM, Burch.

Calyx 5-cleft or deeply 5-lobed ; lobes valvate or nearly so. *Corolla* 5-cleft ; tube elongated, much exceeding the calyx, dilated above the base into a long throat ; limb spreading, oblique ; lobes nearly equal, the 2 posterior exterior. *Stamens* 4, didynamous, included ; filaments inserted near the base of the corolla ; anthers ciliate-hispid, with confluent thecae ; posterior pairs of stamens feeble, shorter, and often with empty anthers. *Ovary*

2-chambered, with numerous ovules ; style exceeding the stamens ; stigma small, obscurely bidentate, emarginate, or sub-capitate. *Fruit* a capsule, compressed at the apex in a plane perpendicular to that of the septum, obcordate, septicidal into usually bifid valves. *Seeds* numerous, compressed-globose.

Low undershrubs, prostrate or densely tufted, mostly woody at the base ; leaves alternate, usually densely crowded, entire, 1-nerved ; inflorescence of abbreviated axillary cymes, or flowers sessile or sub-sessile, axillary and solitary ; bracteolate at the base ; corolla blue or purple.

An African genus of about 15 species ; 10 species in South Africa, extending from the Transvaal and South West Africa through the north-western and central districts ; recorded also from the Mossel Bay, Uitenhage, and Albany districts ; one record from Natal.

7468

4. PELIOSTOMUM, Benth.

Calyx deeply lobed ; lobes valvate or nearly so. *Corolla* 5-cleft ; tube elongated, much exceeding the calyx, with a wide throat and abruptly or gradually contracted towards the narrow base ; limb spreading ; lobes nearly equal, the 2 posterior exterior. *Stamens* 4, didynamous, included ; filaments inserted near the base of the corolla-tube ; anthers usually ciliated, with confluent thecae ; all equally perfect. *Ovary* 2-chambered, with numerous ovules ; stigma almost punctiform, emarginate or very slightly bi-lobed at the apex. *Fruit* a capsule, ovoid-conical or oblong, acute or obtusely pointed, somewhat compressed at the apex, septicidally bivalved, with the valves deeply bilobed. *Seeds* rugose.

Small undershrubs or wiry sub-herbaceous plants, often viscid ; leaves alternate, crowded or scattered, or rarely opposite, quite entire, 1-nerved ; flowers sub-sessile, or shortly pedunculate, axillary, solitary, usually bracteolate at the base ; corolla blue or purple.

An African genus of about 9 species ; 6 species in South Africa, with the same distribution as *Aptosimum*.

7469

5. ALONSOA, Ruiz & Pavon.

Calyx 5-partite ; segments somewhat unequal, imbricate in bud, persistent. *Corolla* unequally 5-lobed ; tube obsolete or very short ; limb in many cases resupinate by the twisting of the peduncel or pedicle ; the two posterior lobes exterior, deeply cut, or separate nearly to the base ; anterior lobe the largest ; throat scarcely concave, without spurs or pouches, or rarely with two shallow pits. *Stamens* 4, all perfect ; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules ; stigma capitate. *Fruit* an ovoid or oblong obtuse capsule, somewhat compressed, septicidally bivalved ; valves emarginate or bifid. *Seeds* numerous, small, punctate-rugose.

Herbs, often perennial, or much-branched undershrubs, with 4-angled branchlets ; leaves mostly opposite, entire or toothed ; the floral leaves alternate, the uppermost bract-like ; inflorescence a terminal, rarely an axillary, raceme ; flowers scarlet.

Species 8 or 9, all natives of tropical and sub-tropical America ; 1 species in South Africa, recorded from the Uitenhage district.

7471

6. DIASCIA, Link & Otto.

Calyx 5-partite ; segments somewhat imbricate, persistent, and slightly or scarcely accrescent in fruit. *Corolla* two-lipped ; tube very short or obsolete ; posterior lip exterior, bifid or quadrifid ; anterior lip trifid or simple, the middle or only lobe emarginate ; all the lobes more or less rounded ; throat usually produced below the anterior lip into 2 (rarely 1,

very rarely without) pits, pouches, or spurs. *Stamens* 4, didynamous; anterior pair of filaments usually bent about the base and passing round the posterior pair, in some species dilated about or below the middle, or forked, in a few species without anthers; the posterior pair with anthers; anther-thecae confluent, usually cohering in pairs. *Ovary* 2-chambered, with numerous ovules; stigma small, simple. *Fruit* an obliquely ovoid sub-globose or elongated capsule, obtuse at the apex, not or scarcely compressed, dehiscing septicidally; the valves inflexed at the lateral edges, entire or emarginate at the apex. *Seeds* numerous, reticulate-foveolate, not winged.

Herbs, usually slender, diffuse or erect, sometimes rigid; leaves opposite or rosulate at the base; the upper leaves sometimes alternate; inflorescence axillary or consisting of terminal racemes; flowers purple, rosy, or copper-coloured.

Endemic; species 47, fairly widely distributed, but not recorded from the Transvaal.

7472

7. HEMIMERIS, Thunb.

Calyx 5-partite; segments somewhat unequal, imbricate in bud. *Corolla* sub-bilabiate, 4-cleft; tube very short or obsolete; posterior lobe exterior, very shortly emarginate; lower lip with two yellow spurs or small pouches at the base, sometimes with two tooth-like appendages clasping the filaments of the stamens by the side of the corolla-throat. *Stamens* 2; filaments kneed at the base, not appendaged, inserted at the base of the corolla-tube; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules; style thinly stigmatose at the apex. *Fruit* a sub-globose or ovoid capsule, septicidal from the apex, equalling or somewhat exceeding the calyx. *Seeds* numerous, angular-ovoid or sub-globose, reticulate, surrounded by a very narrow membranous wing or not winged.

Small slender annual herbs; leaves opposite or the floral leaves sub-fasciculate, nearly entire or more or less deeply toothed; peduncles axillary, 1-flowered; the upper sub-fasciculate, often reflexed in fruit; flowers yellow.

Endemic; species 4, extending from Van Rhynsdorp through the coastal districts to Swellendam; also recorded from the Calvinia and Sutherland districts.

7475

8. COLPIAS, E.Mey.

Calyx 5-partite; segments but little imbricate. *Corolla* 5-lobed; tube moderate in length, somewhat declinate at the base, with two gibbosities or short pouches in front; lobes nearly equal; the two upper exterior. *Stamens* 4, didynamous, declinate, all bearing anthers, inserted at the base of the corolla-tube; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules; style thinly stigmatose at the apex. *Fruit* an ovoid acuminate capsule, dehiscing septicidally; valves bifid. *Seeds* numerous, oblong, carunculate.

A low much-branched shrub; branchlets softly pilose; leaves alternate or scarcely opposite, toothed or incised, petiolate; peduncles axillary, solitary, ebracteate, 1-flowered; flowers rather large, sulphur-yellow.

Endemic; species 1, recorded from Namaqualand.

7476

9. NEMESIA, Vent.

Calyx 5-partite, persistent, somewhat accrescent in fruit; segments scarcely imbricate. *Corolla* bilabiate; tube short, produced in front into a dependent spur or pocket or pouch; posterior lip exterior, 4-cleft; anterior lip consisting of one entire or emarginate lobe and having at its base a convex palate. *Stamens* 4, didynamous; filaments of the anterior pair

usually bent round the posterior pair; anthers usually cohering in pairs about the stigma; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules; style narrowly stigmatose at the apex. *Fruit* a capsule, laterally compressed to a moderate extent; valves boat-shaped, somewhat keeled, obliquely truncate at the apex, rounded or angular at the outer corner. *Seeds* with a hyaline wing.

Herbs or undershrubs, annual or perennial; leaves opposite; inflorescence a terminal raceme, or flowers axillary, ebracteate.

An African genus of about 50 species; 47 species in South Africa, generally distributed.

7477

10. DICLIS, Benth.

Calyx 5-partite; segments scarcely imbricate, persistent, somewhat or scarcely accrescent in fruit. *Corolla* bilabiate; tube short, produced at the base into a dependent spur; posterior lip exterior, bilobed; anterior lip trifid. *Stamens* 4, didynamous; the anterior filaments longer than the posterior, bent round the base; anthers all connate, or connate in pairs about the stigma; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules; stigma small, capitate. *Fruit* a sub-globose or sub-quadrated capsule, not much compressed, emarginate at the apex, with loculicidal dehiscence; valves furrowed down the middle and at length bipartite. *Seeds* irregularly oblong-ovoid, bluntly angular.

Small prostrate or rarely erect herbs, annual or perennial; leaves opposite, or the upper alternate; flowers axillary, ebracteolate.

Species about 7, natives of Africa and Madagascar; 4 species in South Africa, extending from the Transvaal, Natal, and the eastern O.F.S., to the George district; also recorded from the Worcester district.

7480

- 11. LINARIA, Juss.

Calyx 5-partite; segments persistent, imbricate. *Corolla* bilabiate; tube rather long, produced at the base into a long spur, and with a usually rather prominent palate closing the throat; posterior lip exterior, bilobed; anterior lip spreading, trilobed. *Stamens* 4, didynamous, included, sometimes with a rudimentary fifth stamen; anthers 2-theccous, with the thecae parallel. *Ovary* 2-chambered, with numerous ovules; stigma small, usually emarginate. *Fruit* an ovoid or globose capsule, dehiscing by 2 oval-oblong 2-5-toothed persistent valves from near the apex, or by two lateral pores. *Seeds* ovoid or discoid.

Herbs or undershrubs; leaves opposite, verticillate, or alternate, sessile, entire; inflorescence a raceme or spike.

Species about 130, most of which occur in the extra-tropical regions of the northern hemisphere of the old World; 2 species in South Africa, recorded from the Transvaal and from the Cape district.

7482

12. ANTIRRHINUM, Linn.

Calyx 5-partite; segments persistent, imbricate. *Corolla* bilabiate; tube not very short, somewhat compressed, saccate or gibbous at the base, with a broad bearded palate closing the throat; posterior lip exterior, erect, shortly bilobed; anterior lip spreading, trilobed. *Stamens* 4, didynamous, included, sometimes with a rudimentary fifth; anthers 2-theccous; thecae oblong, parallel. *Ovary* 2-chambered, with numerous ovules; stigma small. *Fruit* an ovoid or globose capsule, dehiscing by valved pores. *Seeds* oblong, truncate, rugose or nearly smooth.

Annual or perennial herbs ; leaves opposite or alternate, usually entire inflorescence a raceme, or flowers axillary.

Species about 35, chiefly found in temperate regions in the northern hemisphere ; 1 species in South Africa, found as an introduction near Cape Town.

7492

13. DERMATOBOTRYS, Bolus

Calyx 5-partite ; segments equal, valvate, not or scarcely accrescent in fruit. *Corolla* 5-lobed ; tube trumpet-shaped, long, somewhat incurved, gradually widened upwards, not constricted at the mouth ; lobes equal, with the posterior one exterior. *Stamens* 5, equal, inserted near the top of the corolla-tube ; anthers 2-theous. *Ovary* 2-chambered, with numerous ovules ; stigma small, minutely bifid. *Fruit* a 2-locular ovoid-conical berry. *Seeds* numerous, spheroidal, papillose-scribulate.

A glabrous epiphytic shrub ; leaves opposite, fleshy ; flowers usually 3 together, clustered at the nodes on the branchlets, bracteate at the base.

Endemic ; species 1, found in Zululand, Natal, and Pondoland.

7493

14. HALLERIA, Linn.

Calyx cup-shaped or sub-rotate, 3-5-cleft, tough, persistent. *Corolla* 4-5-cleft, slightly bilabiate ; tube trumpet- or funnel-shaped, rather long, somewhat declinate-incurved or nearly straight ; lobes short, with the posterior lip exterior. *Stamens* 4, didynamous, or nearly equal, inserted about the middle of the corolla-tube ; anthers 2-theous, with the thecae diverging and at length divaricate. *Ovary* 2-chambered, with numerous ovules ; style minutely stigmatose at the apex, usually exerted. *Fruit* a berry. *Seeds* several or many, somewhat compressed, sub-orbicular or elliptic, narrowly winged.

Glabrous shrubs or small trees ; leaves opposite, ovate or elliptic, toothed or sub-entire ; flowers axillary, sub-fasciculate.

Species 5, natives of Africa and Madagascar ; 3 species in South Africa, recorded from the Transvaal, Natal, and the eastern O.F.S., then from Grahams-town through the coastal districts to Clanwilliam ; 1 species recorded also from the Somerset East and Wodehouse districts.

7494

15. TEEDIA, Rudolphi

Calyx 5-partite, persistent ; segments but little imbricate. *Corolla* deciduous, 5-lobed ; tube cylindric, about equalling or rather exceeding the calyx, bearded and marked with 5 spots at the apex ; lobes imbricate, with the two posterior lobes exterior. *Stamens* 4, didynamous, sometimes with a rudimentary fifth, included, inserted near the base of the corolla-tube ; anthers 2-theous, with the thecae parallel. *Ovary* 2-chambered, with numerous ovules ; stigma ovoid, capitate, rugose, minutely cleft at the apex. *Fruit* a sub-globose berry. *Seeds* numerous, ovoid, rugose, not winged.

Biennial or perennial shrubs ; leaves opposite, more or less ovate, denticulate ; flowers purplish.

Endemic ; species 2, found in Namaqualand and extend from the Paarl to the Uniondale district ; also found near Kingwilliamstown and in Natal.

7495

16. PHYGELIUS, E.Mey.

Calyx 5-partite ; segments persistent, not accrescent in fruit, imbricate. *Corolla* 5-lobed ; tube trumpet-shaped, long, incurved or nearly straight, gradually dilated upwards ; lobes sub-equal, with the two posterior exterior. *Stamens* 4, sometimes with a rudimentary fifth, didynamous, inserted below

the mouth of the corolla, exserted; anthers 2-theccous, with the thecae parallel. *Ovary* 2-chambered, with numerous ovules; stigma small, minutely bifid. *Fruit* an ovoid more or less oblique septicidal capsule, with entire valves. *Seeds* irregularly ovoid, bluntly angular, reticulately veined, minutely papillose.

Robust undershrubs; leaves opposite; inflorescence in terminal secund paniculate cymes.

Endemic; species 2, extending from the Transvaal, Natal, the eastern O.F.S., and Basutoland to the Albany district; also recorded from the Somerset East, Graaff-Reinet, and Aliwal North districts.

7497

17. FREYLINIA, Pangelli.

Calyx 5-partite, campanulate, persistent; segments broadly ovate or sub-orbicular, imbricate. *Corolla* 5-lobed; tube sub-cylindric, straight, exceeding the calyx; lobes imbricate, with the two posterior exterior. *Stamens* 4, didynamous, occasionally a rudimentary fifth stamen present, included; filaments inserted about or above the middle of the corolla-tube; the pairs somewhat unequal in length; anthers 2-theccous, with the thecae parallel. *Ovary* 2-chambered, with several ovules; stigma capitate, ovoid, thicker than the style. *Fruit* an ovoid obtuse septicidal capsule; valves bifid. *Seeds* few, discoid, with a membranous margin.

Shrubs; leaves opposite, verticillate, or scattered, sessile, entire; inflorescence cymose.

Endemic; species 2, extending from the Clanwilliam to the Uitenhage districts; also recorded from Namaqualand and Somerset East.

7497a

18. MANULEOPSIS, Thell.

Calyx 5-cleft; segments linear-lanceolate. *Corolla* 5-lobed; tube sub-cylindric, straight, exceeding the calyx; lobes imbricate, with the two posterior exterior. *Stamens* 4, didynamous, included; filaments inserted about $\frac{1}{3}$ of the way up the corolla-tube; anthers kidney-shaped, 1-theccous. *Ovary* 2-chambered, with several ovules in each chamber; style terete; stigma wedge-shaped, with 2 stigmatic faces. *Fruit* a septicidal capsule; valves bifid. *Seeds* angled.

A shrub about 6 feet high; leaves opposite, simple, petioled, toothed; flowers in cymes arranged in a lax raceme.

Endemic; species 1, found in South West Africa.

7498

19. IXIANTHES, Benth.

Calyx tripartite, rigidly foliaceous; segments valvate; the posterior segments broader than the others and trifid at the apex; anterior segments entire. *Corolla* bilabiate, 5-lobed, viscid-pubescent; tube sub-globosc, gibbous-ventricose at the back; lobes not very unequal; posterior lip exterior, bilobed; anterior lip slightly shorter than the other, deeply trilobed. *Stamens* 2, included, inserted at the base of the corolla-tube, with 2 or 3 interposed shorter setiform staminodes; perfect anthers with 2 thick divaricate thecae confluent at the apex. *Ovary* 2-chambered, densely glandular, with numerous ovules; style glandular at the base, minutely stigmatose at the apex. *Fruit* an ovoid, sub-4-angled acute capsule, with septicidal dehiscence; valves shortly bifid. *Seeds* numerous, ovoid-oblong, truncate, obtusely angled, reticulate.

A shrub, with erect branches and the habit almost of a *Retzia*; leaves whorled, narrow; flowers axillary, numerous.

Endemic; species 1, recorded from the Tulbagh district.

7499

20. ANASTRABE, E.Mey.

Calyx 5-cleft, persistent; segments valvate. *Corolla* bilabiate; tube short; posterior lip bipartite, exterior in bud; anterior lip larger than the posterior, very shortly trifid. *Stamens* 4, didynamous, the fifth rudimentary; anther-thecae confluent at the apex. *Ovary* 2-chambered, with several ovules; style truncate or emarginate at the stigmatose apex. *Fruit* an ovoid septicidal capsule; valves bifid. *Seeds* few, with a membranous netted testa.

A shrub or tree; leaves opposite; inflorescence in axillary and terminal cymes.

Endemic; species 1, found in Natal and Pondoland.

7500

21. BOWKERIA, Harv.

Calyx 5-partite, persistent; segments imbricate; the posterior the broadest. *Corolla* bilabiate; tube short, ovoid, ventricose; upper lip shortly 2-toothed, exterior; lower lip inflated, shortly or deeply 3-toothed. *Stamens* 4, didynamous, with or without a staminode, inserted at the base of the corolla-tube; one or both pairs shorter than the corolla; anthers all perfect, with the thecae confluent at the apex. *Ovary* 2-3-chambered, with many ovules; stigma simple, small. *Fruit* an ovoid or oblong septicidal capsule; valves 3 or 2. *Seeds* numerous, small, oblong, fusiform or incurved, angular, with a somewhat loose reticulate testa.

Shrubs or trees; leaves sessile or shortly petiolate, usually ternate; inflorescence axillary or sub-terminal.

Endemic; species 6, extending from the northern Transvaal, Natal, and the eastern O.F.S., to the Amatolas and the Kingwilliamstown district.

7517

22. MANULEA, Linn.

Calyx deeply 5-lobed, or in some species deeply 5-cleft to about $\frac{1}{2}$ way down, rarely bilabiate; segments or lobes persistent, scarcely or not imbricate. *Corolla* 5-lobed; tube more or less slender and usually exceeding the calyx, somewhat dilated and often gently curved about the throat, without any spur or pouch; lobes imbricate; the posterior lobe exterior and shorter, or the lobes nearly equal. *Stamens* 4, didynamous, inserted on the throat or upper half of the corolla-tube; upper pair of anthers fertile or barren; lower pair fertile; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules; stigma narrowly sub-clavate, entire, obtuse. *Fruit* a septicidal capsule; valves bifid at the apex; seeds numerous, rugose, not winged.

Annual or perennial herbs, rarely undershrubs; leaves sometimes all radical and rosulate, sometimes also cauline and opposite, or the uppermost alternate, entire or toothed; the floral leaves smaller and bract-like; inflorescence a simple raceme or spike, or oftener compound, thyrsoid or paniculate, terminal; calyx ebracteate or with small free bracts at the base.

An African genus of 35 species, all found in South Africa, widely distributed; two species extend into tropical Africa.

7519

23. SUTERA, Roth.

Calyx 5-lobed, usually 5-parted; lobes or segments more or less imbricate. *Corolla* 5-lobed or bilabiate; tube long or short, exerted or shorter than the calyx, cylindric or funnel-shaped; throat more or less dilated or scarcely so, sometimes gibbous; lobes entire, or shortly bifid, or emarginate at the apex, equal or nearly so, imbricate, with the two posterior lobes or upper lip exterior. *Stamens* 4, didynamous, exerted, or all or the posterior pair

included, inserted in the corolla-tube; anthers all perfect, with the thecae confluent. *Ovary* 2-chambered, with numerous ovules; stigma obtuse or rarely 2-fid. *Fruit* a septicidal capsule; valves cleft at the apex. *Seeds* numerous, rugose.

Herbs or small shrubs, annual or perennial, sometimes viscid, often turning blackish when dried; leaves mostly opposite, more or less toothed or subentire; inflorescence a terminal simple cyme or spike, or rarely compound, or flowers axillary; bracts not adhering along the pedicels.

Species about 115, mostly South African and widely distributed; a few in tropical Africa, and one species peculiar to the Canary Islands.

7521

24. PHYLLOPODIUM, Benth.

Calyx 5-cleft or deeply 5-lobed, persistent; lobes or segments equal or nearly so. *Corolla* 5-lobed; tube sub-cylindric, somewhat dilated about the top, more or less exceeding the calyx; lobes not very unequal, entire or retuse, shorter than the tube, with the two posterior lobes exterior. *Stamens* 4, didynamous, inserted on the corolla-tube; anthers all fertile, with the thecae confluent. *Ovary* 2-chambered, with numerous or few ovules; style narrowly clavate towards the obtuse entire stigmatic apex. *Fruit* an ovoid oblong or sub-globose somewhat compressed capsule, with septicidal dehiscence; valves bifid. *Seeds* few or numerous, irregularly pyramidal-polyhedral, with a membranous testa.

Annual, occasionally suffruticose, herbs, more or less viscid-pilose, sometimes turning dusky when dried; leaves opposite, or the upper alternate; inflorescence usually a terminal simple spike; bract 1, basal, more or less leaf-like, adnate below to the calyx or to the short pedicel.

Endemic; species 20, extending from the Transvaal through the coastal districts to Clanwilliam and Namaqualand; also recorded from the Somerset East, Cradock, and Graaff-Reinet districts; not recorded from Natal.

7522

25. POLYCARENA, Benth.

Calyx bilabiate, bifid, or bipartite in fruit, 5-toothed, persistent; the anterior lip 2-toothed; the posterior lip 3-toothed. *Corolla* 5-lobed; tube sub-cylindric or campanulate, exceeding the calyx, or nearly included; lobes not very unequal, or the two posterior connate high up, entire, exterior. *Stamens* 4, didynamous, inserted on the corolla-tube; anthers all alike, with the thecae confluent. *Ovary* 2-chambered, with numerous ovules; style narrowly clavate towards the obtuse stigmatic apex. *Fruit* an ovoid or sub-globose somewhat compressed capsule with septicidal dehiscence, bursting the calyx. *Seeds* numerous or several, small, irregularly pyramidal-polyhedral.

Annual or rarely perennial herbs, more or less viscid-pilose, scarcely turning black when dry; lower leaves opposite or crowded; upper leaves alternate or opposite; inflorescence terminal, mostly spicate; bracts leaf-like, more or less adnate below to the calyx and to the short pedicel.

Species 21; 1 species found in tropical Africa; the remainder in South Africa, extending from the Transvaal and Namaqualand to the south-western districts; also recorded from the Riversdale and Uitenhage districts.

7523

26. ZALUZIANSKYA, F. W. Schmidt

Calyx persistent, 5-cleft, or shortly 5-toothed, bipartite or bilabiate; lips 3-lobed and 2-lobed respectively. *Corolla* 5-lobed, nearly regular, or bilabiate; tube usually much exceeding the calyx, at length splitting at the base; lobes equal or unequal, emarginate or bifid, the upper exterior;

throat hairy or glabrous. *Stamens* usually 4, didynamous, or rarely only 2 by the abortion of the anterior pair, inserted near or at the top of the corolla-tube; anterior pair of anthers smaller or barren; anther-thecae confluent. *Ovary* 2-chambered, with numerous ovules; style somewhat club-shaped at the stigmatose apex. *Fruit* an ovoid-oblong capsule, with septiceidal dehiscence; valves bifid. *Seeds* numerous, small.

Annual or perennial herbs, more or less viscid and usually turning black in drying; leaves simple, toothed or entire; the lower opposite; the upper often alternate; inflorescence a terminal spike, or rarely flowers axillary; bracts usually entire, adpressed or adnate to the calyx, rarely free.

Endemic; species 32, widely distributed.

7524

27. MIMULUS, Linn.

Calyx tubular, pentagonal, 5-toothed; lobes somewhat unequal. *Corolla* bilabiate; tube cylindric below, not or but little dilated above; posterior lip bilobed, exterior in bud; anterior lip trilobed, usually marked with two protuberances in the throat; all the lobes nearly equal. *Stamens* 4, didynamous, inserted near the base of the corolla-tube; anthers all fertile, 2-theous, with the thecae at length confluent at the apex. *Ovary* 2-chambered, with numerous ovules; style usually bi-lobed at the apex. *Fruit* an oblong or sub-linear capsule, with loculicidal dehiscence; valves entire, or rarely bifid. *Seeds* small, numerous, irregularly ovate, prismatic, nearly smooth.

Decumbent or erect herbs; leaves opposite, simple, entire or toothed; inflorescence a terminal leafy raceme, or flowers axillary and solitary; peduncles ebracteate.

Species about 60, principally found in extra-tropical America; 1 species in South Africa, extending from the Transvaal, Natal, and the eastern Orange Free State to the Albany district; also recorded from the Somerset East, Graaff-Reinet, and Albert districts.

7546

28. MONIERA, P.Br.

(*Bacopa*, Aubl.)

Calyx 5-partite; segments imbricate; the back one the broadest. *Corolla* sub-bilabiate; tube cylindric; posterior lip emarginate or bilobed, exterior; anterior lip 3-lobed; all the lobes equal or the two posterior connate higher up than the other three. *Stamens* 4, didynamous, inserted on the corolla-tube, included; anthers all fertile, 2-theous; the thecae distinct, contiguous, parallel or divaricate, or finally confluent. *Ovary* 2-chambered, with numerous ovules; style dilated at the apex, concave or slightly bilobed. *Fruit* a globose or ovoid capsule, with loculicidal dehiscence; valves bifid or bipartite. *Seeds* numerous, usually striate and transversely reticulate.

Herbs, usually glabrous; leaves opposite; inflorescence a terminal leafy raceme, or more usually flowers axillary and solitary.

Species about 50, chiefly tropical American; 1 species in South Africa, recorded from the Herbert district.

7558

29. LIMOSELLA, Linn.

Calyx shortly 5- or rarely 4-toothed, strongly or feebly 5-nerved. *Corolla* 5-cleft; lobes sub-equal, imbricate, with the posterior lobe exterior. *Stamens* 4, didynamous, or rarely only 2; anthers all fertile, with the thecae confluent. *Ovary* shortly 2-chambered at the base, with numerous ovules; style often eccentric or oblique, sub-capitate at the stigmatic apex. *Fruit* a sub-globose or spheroidal capsule, almost indehiscent, or at length dehiscent. *Seeds* numerous, ovoid or oblong-sulcate, striate, rugulose.

Marsh or aquatic herbs, usually creeping and usually with stolon-like stems rooting at the nodes, or rarely caulescent; leaves usually all radical or some of them fasciculate at the nodes, rarely alternate on long elongated prostrate stems or branches; flowers inserted among the leaves on scape-like peduncles, or sub-sessile, white, pale-rosy, or bluish.

Species about 6, widely distributed; 5 species recorded from South Africa, fairly widely distributed.

7560

30. CRATEROSTIGMA, Hochst.

Calyx 3-toothed, 5-ribbed; teeth nearly equal. *Corolla* bilabiate; tube about equalling the calyx; posterior lip entire or emarginate, exterior; anterior lip 3-lobed, biconvex and often bearded at the base. *Stamens* 4, didynamous; filaments of the posterior pair short; filaments of the anterior pair long, sharply bent, kneed, or appendaged at the base; anthers all perfect, approximating or cohering by pairs, 2-theecous, with the thecae diverging. *Ovary* 2-chambered, with numerous ovules; style dilated and very shortly bilamellate at the somewhat cup-shaped apex. *Fruit* an oval or oblong capsule with septicidal dehiscence. *Seeds* numerous, very small, ellipsoid or sub-globose, tubercular-rugose.

Small perennial herbs, acaulescent or cauline; radical leaves rosulate; cauline leaves opposite; all entire or nearly so; inflorescence a spike or raceme, rarely the flowers solitary.

An African genus of 12 species; 3 species in South Africa, found in the northern Transvaal, the eastern O.F.S., and Pondoland.

7561

31. TORENIA, Linn.

Calyx bilabiate, 5-toothed; the tube ribbed or winged. *Corolla* bilabiate; tube sub-cylindric; posterior lip bilobed, exterior; anterior lip 3-lobed. *Stamens* 4, didynamous, inserted about the top of the corolla-tube; filaments of the anterior pair longer than the others, arched, and connivent under the posterior corolla-lip; anthers all fertile, closely approximating in pairs, 2-theecous; thecae diverging and usually confluent at the apex. *Ovary* 2-chambered, with numerous ovules; style somewhat bilamellate at the apex. *Fruit* an oblong or oval capsule with septicidal dehiscence. *Seeds* numerous, minutely tuberculate or rugose.

Herbs; leaves mostly opposite; inflorescence a terminal raceme.

Species about 20, distributed over the tropical and warmer regions of the world; 1 species in South Africa, recorded from the Transvaal.

7564

32. ILYSANTHES, Rafn.

Calyx 5-toothed, -cleft, or -partite, not strongly 5-ribbed nor winged on the ribs. *Corolla* bilabiate; tube cylindric or somewhat campanulate above; posterior lip shortly bifid, exterior; anterior lip 3-lobed; lobes nearly equal. *Stamens* 2, or 4 and didynamous, inserted on the upper part of the corolla-tube; perfect anthers only 2, often cohering, 2-theecous, with the thecae diverging; staminodes 2 or 0. *Ovary* 2-chambered, with numerous ovules; style shortly bilamellate at the apex. *Fruit* an ovoid oblong or sub-fusiform capsule with septicidal dehiscence. *Seeds* numerous, minutely tuberculate or rugose.

Annual or perennial herbs; leaves opposite, entire or toothed; flowers axillary, solitary or a few together; pedicels without bracts.

Species about 20, occurring in the tropical and warmer parts of the World; 7 species in South Africa, extending from the Transvaal and Natal to the south-western districts.

7566

33. HEBENSTREITIA, Linn.

Calyx split open in front, entire or notched behind. *Corolla* 4-lobed, sometimes with a minute fifth lobe in the fissure of the tube; tube slender, divided in front down to or below the middle, expanded behind into a flat or concave 4-lobed limb; lobes sub-equal, or the intermediate pair longer or deeply connate. *Stamens* 4, didynamous, inserted on the margins of the divided corolla-tube below the lobes; anthers all fertile. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style entire. *Fruit* 2-locular, or one loculus abortive, rarely separating into 2 distinct cocci. *Seeds* oblong, cylindric.

Shrubs, undershrubs, or annual herbs; leaves alternate, or the lower opposite, often narrow, entire or often toothed; inflorescence a terminal often dense short or elongated spike; flowers sessile, white, yellow, or rose; bracts exceeding the calyx, broad or narrow, or the lower somewhat leaf-like.

An African genus of 31 species; 30 species in South Africa, found in the coastal districts from Namaqualand to Natal and the Transvaal, mostly massed in the south-western districts; also found in the central districts; 10 species extend into tropical Africa.

7567

34. DISCHISMA, Choisy

Calyx 2-partite. *Corolla* 4-lobed; tube slender, divided in front to or below the middle, dilated behind and expanded into a flat or concave 4-lobed limb; lobes sub-equal, or the middle pair longer. *Stamens* 4, didynamous, affixed to the margin of the divided corolla-tube below the lobes; anthers all fertile. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style entire. *Fruit* 2-locular, with both loculi usually perfect, rarely separating into 2 distinct cocci. *Seeds* oblong, cylindric.

Small branched shrubs or annual herbs; leaves alternate, or the lower opposite, often narrow and toothed; inflorescence a terminal dense short or elongated spike, rarely a head; bracts ovate or lanceolate, sometimes leaf-like.

Endemic; species 11, extending from Namaqualand to the Port Elizabeth district; 1 species naturalised in Western Australia.

7568

35. SELAGO, Linn.

Calyx shortly or deeply 5-lobed. *Corolla* 5-lobed or somewhat bilabiate; tube various, always more or less dilated in the throat; posterior lobes exterior, shorter than the anterior lobes; the middle anterior lobe usually longer than the outer pair. *Stamens* 4, didynamous, inserted at the base of the corolla-throat, shortly or much exserted; anthers perfect, 1-theecous; staminode usually absent, if present then small. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style slightly thickened or minutely 3-toothed at the apex. *Fruit* oblong, ovoid, or sub-globose, included within the calyx, often breaking up into cocci. *Seeds* oblong or rounded.

Shrubs or undershrubs, usually dwarf, much branched and heath-like, sometimes annual herbs; leaves solitary or fascicled, alternate, or the lower sometimes opposite or sub-opposite; inflorescence a spike, head, or panicle, or frequently an elongated panicle or broad corymb of heads; bracts narrow or broad, sometimes adnate to the pedicels.

An African genus of 129 species; 112 species in South Africa, widely distributed.

7568a

36. WALAFRIDA, E.Mey.

Calyx 3-lobed or 3-partite, with the middle lobe usually smaller, sometimes minute and wanting. *Corolla* 5-lobed, or sometimes partially bilabiate; tube short or somewhat elongated, often narrow at the base, broader in the throat; the two posterior lobes exterior, sometimes shorter than the others, and the middle anterior lobe rather longer than the others. *Stamens* 4, didynamous, inserted in the corolla-throat, more or less exserted; anthers perfectly 1-theccous. *Ovary* 2-chambered, with a pendulous ovule in each chamber; style obtuse, slightly clavate or minutely 2-toothed at the apex. *Fruit* ovoid, globose, or oblong, included within the calyx, often separating into distinct cocci when mature. *Seeds* short or oblong.

Shrubs or undershrubs, often heath-like, dwarf and much branched, sometimes small annual herbs; leaves narrow or small, sometimes minute, alternate, often crowded in axillary fascicles, entire; inflorescence a terminal spike or head, often corymbose or paniced; flowers sessile, bracteate.

An African genus of 36 species; 31 species in South Africa, extending from the south-western districts to East London, and into the central and north-western districts, the Transvaal, and Natal.

7569

37. MICRODON, Choisy

Calyx shortly and sub-equally 5-toothed, adnate at the base to the bract. *Corolla* 5-lobed; tube cylindric or slightly enlarged at the throat; upper lobes exterior, united to about the middle. *Stamens* 4, didynamous, fixed in the throat of the corolla; the outer pair slightly exserted; anthers all perfect, 1-theccous. *Ovary* 2-chambered, with one chamber smaller and the ovule abortive, with a single pendulous ovule in the perfect chamber; style obtuse at the apex. *Fruit* included within the calyx, with only one loculus perfect.

Small much branched heath-like shrubs; leaves sometimes fascicled; inflorescence a spike; bracts ovate or sub-orbicular, adnate at the base to the calyx.

Endemic; species 5, extending from Clanwilliam to Worcester; also recorded from the Ceres district.

7570

38. GOSELA, Choisy

Calyx 5-lobed nearly to the middle, with nearly equal lobes. *Corolla* 5-lobed; tube slender, elongated, with the mouth slightly constricted; lobe sub-equal; the posterior lobes exterior. *Stamens* 2, inserted above the middle of the tube, included; anthers perfect, 1-theccous; staminodes 2, fixed to the apex of the tube. *Ovary* 2-chambered, with a solitary pendulous ovule in each chamber; style entire. *Fruit* included within the calyx, by abortion 1-locular.

A small much branched heath-like shrub; leaves linear, small, more or less fascicled; inflorescence a spike, with the rhachis bracts and calyx densely hirsute-villous.

Endemic; species 1, recorded from the Piquetberg district.

7571

39. AGATHELPIS, Choisy

Calyx shortly 5-toothed, adnate to the base of the bract. *Corolla* 5-lobed, slender, elongated, very little enlarged at the throat; lobes obovate-oblong, sub-equal, with the posterior lobes exterior. *Stamens* 2, inserted above the middle of the tube, included; anthers perfect, 1-theccous; staminodes 0. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style entire. *Fruit* included within the calyx, oblong, by abortion 1-locular and 1-seeded.

Small much branched heath-like shrubs ; leaves small, often fascicled ; inflorescence a spike ; bracts ovate or oblong, more or less adnate to the calyx and including it.

Endemic ; species 3, extending from Van Rhynsdorp to Swellendam ; also recorded from the Ceres district.

7579

40. VERONICA, Linn.

Calyx usually 4-partite ; segments scarcely imbricate. *Corolla* 4-5-cleft ; tube very short, posterior lobes interior. *Stamens* 2, inserted on the corolla-tube on the sides of the posterior lobes, exserted ; anthers 2-theccous, with the thecae confluent at the apex. *Ovary* 2-chambered, with few or numerous ovules ; style stigmatose at the sub-capitate apex. *Fruit* a locudicidal or septicidal capsule. *Seeds* few or numerous, ovoid or orbicular.

Herbs or shrubs ; leaves usually opposite ; inflorescence a raceme, or flowers axillary and solitary.

Species over 200, found chiefly in temperate regions ; 2 species found as weeds in South Africa.

7593a

41. GLUMICALYX, Hiern

Calyx 5-partite ; segments glumaceous, laciniate or glandular-fimbriate at the apex. *Corolla* 5-lobed, bilabiate ; tube about equalling the calyx ; posterior lip bifid, interior ; anterior lip deeply 3-lobed, with the middle lobe the innermost. *Stamens* 4, didynamous, exserted ; the longer pair adnate to the lower half of the corolla-tube ; the shorter pair to the middle of the corolla-tube ; anthers all perfect, with the thecae confluent. *Ovary* 2-chambered, deeply furrowed on the sides and almost sub-didymous, with numerous ovules ; style inserted between the parts of the indented apex of the ovary, scarcely dilated at the lanceolate short stigmatic apex.

An undershrub ; leaves scattered, rather crowded, crenate ; inflorescence sub-capitate, bracteate.

Endemic ; species 1, recorded from the Mont-aux-Sources.

7593b

42. CHARADROPHILA, Marloth

Calyx deeply 5-cleft ; lobes nearly equal. *Corolla* bilabiate ; tube short, dilated at the top and with the throat bearded behind ; posterior lip bilobed, partly interior ; anterior lip trilobed. *Stamens* 4, nearly equal, sometimes with a rudimentary fifth or nearly perfect stamen inserted about the base of the corolla-tube ; anthers 2-theccous, with the thecae diverging or nearly parallel. *Ovary* 2-chambered, with numerous ovules ; style quite entire. *Fruit* an ovoid somewhat compressed apiculate or acuminate capsule, dehiscent both septicidally and loculicidally. *Seeds* rather numerous, ovoid, rugose, black.

A branched or sub-acaulous herb ; leaves radical and cauline, opposite, petiolate ; inflorescence centripetal.

Endemic ; species 1, recorded from near Stellenbosch.

(This genus is placed in the family *Gesneriaceae* by Dalla Torre and Harms)

7597

43. MELASMA, Berg.

Calyx foliaceous or sub-foliaceous ; tube shortly 5-cleft, angular or strongly nerved ; teeth deltoid or lanceolate, valvate. *Corolla* 5-cleft, sometimes bilabiate ; tube equalling or exceeding the calyx ; lobes entire, with the posterior lobes interior. *Stamens* usually 4, didynamous or nearly equal, inserted about or below the middle of the corolla-tube ; filaments glabrous or the longer bearded ; anthers all perfect, approximating in pairs, naked

or bearded on the back, with the thecae distinct and nearly parallel. *Ovary* 2-chambered, with numerous ovules; style bent downwards or curved near the apex; stigma narrowly linguiform, entire or bifid. *Fruit* a sub-globose capsule, included in the calyx, with loculicidal dehiscence; valves usually entire. *Seeds* very numerous, sub-linear.

Herbs, usually annual and parasitic, turning dusky when dried, of an hispid or scabrid; leaves opposite or scattered, sometimes scale-like; inflorescence a raceme or spike; flowers mostly yellow or orange, and with often brown or purple veins; pedicels bibracteolate.

Species about 24, distributed in Brazil, Mexico, Madagascar, east India, and Africa; 8 species in South Africa, fairly widely distributed.

7605

44. GERARDIINA, Engl.

Calyx 5-toothed; teeth nearly equal, much shorter than the tube. *Corolla* 5-lobed; tube ventricosely dilated above the calyx, somewhat narrowed at the mouth; lobes not quite equal; the posterior lobes interior. *Stamens* 4, inserted on the lower part of the corolla-tube; filaments unequal; the longer pair strongly pilose; the shorter pair less strongly pilose; anthers all fertile, with the thecae distinct above the base, gently curved, sub-parallel or diverging. *Ovary* 2-chambered, with numerous ovules; style arching above; stigma slightly dilated. *Fruit* an ovoid capsule, equalling the calyx, with loculicidal dehiscence. *Seeds* numerous, linear-cuneiform, violet coloured.

An erect herb; leaves opposite, narrow, sessile; inflorescence a raceme, terminal, elongated; flowers purple-violet or violet-blue; pedicels bracteate at the base.

Species 1, found in the northern Transvaal and also in tropical Africa.

7611

45. BUTTONIA, McKen

Calyx shortly 4- or 5-lobed, widening in fruit; lobes shortly ovate, valvate. *Corolla* 5-lobed; tube broadly funnel-shaped, somewhat curved and ventricose, expanding above into a wide throat; lobes rounded, not very unequal, imbricate; the posterior lobes interior. *Stamens* 4, didynamous, inserted on the upper part of the corolla-tube, scarcely exerted; anthers approximating in pairs; in the anthers of the shorter stamens, one theca perfect and mucronate at the base, the other theca empty and flexuous and vermiform; in the anthers of the longer stamens, one theca perfect and mucronate at the base, the other theca empty and shortly rudimentary. *Ovary* 2-chambered, with numerous ovules; style curved into a crozier at the apex. *Fruit* a sub-globose capsule, included in the enlarged calyx, with loculicidal dehiscence. *Seeds* numerous, conical-oblong, truncate at each end.

Slender climbing shrubs; leaves opposite, pinnatisect; flowers handsome, rather large, axillary.

An African genus of 3 species; 1 species in South Africa, recorded from Zululand and Natal.

7614

46. GRADERIA, Benth.

(*Bopusia*, Presl)

Calyx 5-lobed; lobes equalling or rather longer than the tube. *Corolla* 5-lobed; tube exerted, somewhat ventricose; lobes not very unequal, with the two posterior lobes interior. *Stamens* 4, didynamous, inserted below the middle of the corolla-tube, shortly included; filaments pilose, at least near the base; anthers 2-thealous, with the thecae diverging and one theca usually narrower than the other. *Ovary* 2-chambered, with numerous ovules;

style incurved above, somewhat thickened at the stigmatic short bifid apex. *Fruit* an acute or acuminate capsule, included in the persistent calyx, with loculicidal dehiscence. *Seeds* numerous, obovoid-oblong.

Perennial undershrubs; stems numerous, more or less trailing or erect; leaves opposite or alternate; flowers axillary, sub-sessile, purple.

Species 3; 1 species in Socotra; 2 species in South Africa, extending from the Transvaal and Natal to the Riversdale district.

7616

47. SOPUBIA, Hamilt.

Calyx 4- or 5-cleft; lobes valvate. *Corolla* 5-lobed, bilabiate; tube short, rather narrow, widened at the throat; posterior lip 2-lobed, interior; anterior lip 3-lobed, with the lobes often connate rather high up. *Stamens* 4, inserted on the corolla-tube, shortly exserted or nearly included; anthers cohering in pairs, or all together, 2-theous; one theca ovate or oblong, perfect; the other theca empty, small, stipitate. *Ovary* 2-chambered, with numerous ovules; style recurved above; stigma somewhat thickened, linguiform or sub-lanceolate. *Fruit* an ovoid or oblong capsule, rounded or compressed at the apex, retuse or emarginate, with loculicidal dehiscence. *Seeds* numerous, obovoid or oblong.

Erect branched rigid herbs, usually turning dusky in drying, except the hoary-tomentose specimens; leaves alternate, opposite, or verticillate, narrow or cut into narrow segments; inflorescence a raceme or spike, with the flowers solitary in the axils of bracts; pedicels bibracteolate.

Species 20, natives of Africa, Madagascar, and India; 5 species in South Africa, extending from the Transvaal and Natal as far as Kynsna.

7622

48. BUECHNERA, Linn.

(*Buchnera*, Linn.)

Calyx 4-5-toothed; tube cylindric, 8-10-nerved and usually 5-10-ribbed; teeth short, acute. *Corolla* 4- or 5-lobed, or rarely 6-lobed; lobes not very unequal, with the two posterior lobes interior. *Stamens* 4, didynamous, inserted about the middle of the corolla-tube, included; anthers all perfect and nearly equal, 1-theous. *Ovary* 2-chambered, with numerous ovules; style thickened or clavate at the stigmatic apex, entire or emarginate. *Fruit* an oblong capsule with loculicidal dehiscence; valves entire. *Seeds* obovoid or oblong.

Rather rigid herbs, somewhat scabrid, turning dusky in drying, probably parasitic; leaves opposite or quasi-verticillate, or the upper alternate; the floral leaves reduced to bracts; inflorescence a spike, terminal at the end of the stem and branches; flowers sessile or sub-sessile, bibracteolate, blue, purple, or white.

Species about 76, dispersed over the hotter parts of the world; 4 species in South Africa, extending from the Transvaal and Natal to the south-western districts.

7623

49. CYCNIUM, E.Mey.

Calyx 5-toothed; tube 10-nerved or 10-ribbed. *Corolla* sub-bilabiate, 5-lobed; tube slender, elongated; lobes broadly obovate, with the upper lobes connate higher up than the others and interior. *Stamens* 4, didynamous, included; filaments bearded; anthers 1-theous, all perfect. *Ovary* 2-chambered, with numerous ovules; stigma not much thickened, acute. *Fruit* an oval ovoid or somewhat conical capsule, somewhat fleshy, acute or apiculate, with loculicidal dehiscence. *Seeds* very numerous, small, ovoid or oblong.

Erect or prostrate herbs, turning dusky when dry, half-parasitic ; leaves opposite or alternate ; inflorescence a terminal raceme, or flowers axillary ; pedicels bibracteolate.

An African genus of 25 species ; 3 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district.

7624

50. RHAMPHICARPA, Benth.

Calyx 5-cleft or deeply 5-lobed ; lobes acute or acuminate. *Corolla* 5-lobed ; tube slender, elongated ; lobes obovate ; the two upper lobes connate higher up than the others, interior. *Stamens* 4, didynamous, included ; anthers 1-theous, with the connective very shortly prolonged at the apex. *Ovary* 2-chambered, with numerous ovules ; stigma not much thickened, acute. *Fruit* a usually beaked somewhat vertically compressed capsule, with loculicidal dehiscence. *Seeds* numerous, small, obovoid or oblong.

Erect or procumbent herbs, turning dusky in drying, probably half-parasitic ; leaves opposite, or the upper alternate, simple or pinnatisect ; inflorescence a terminal raceme, or flowers axillary.

Species about 25, found in Africa, east India, and Australia ; 3 species in South Africa, extending from the Transvaal and Natal to the George district.

7625

51. STRIGA, Lour.

Calyx 5-cleft or -toothed, persistent ; tube cylindric, 5-15-ribbed ; lobes or teeth lanceolate or subulate, somewhat unequal. *Corolla* bilabiate ; tube narrow, strongly curved about or above the middle ; posterior lobe entire, emarginate or bifid, interior ; anterior lobe trifid, usually longer than the posterior lobe. *Stamens* 4, included, inserted about or below the middle of the corolla-tube ; anthers all perfect, with the thecae confluent. *Ovary* 2-chambered, with numerous ovules ; style thickened or club-shaped at the stigmatic apex. *Fruit* an oval-oblong capsule, with loculicidal dehiscence and shorter than the calyx. *Seeds* numerous, obovoid or oblong.

Parasitic herbs or half-parasites ; leaves opposite, or the upper alternate, narrow, sessile or sub-sessile, sometimes all scale-like ; the floral leaves similar and gradually smaller ; flowers solitary in the axils of the upper leaves or bracts, bibracteolate.

Species about 30, distributed over the hotter parts of Africa, Asia, and Australia ; 6 species in South Africa, fairly widely distributed, but absent from the south-western districts.

7627

52. HARVEYA, Hook.

Calyx unequally 5-lobed ; tube campanulate or oblong, or in one species dimidiate, angular or ribbed ; lobes short or deep, valvate. *Corolla* 5-lobed ; tube more or less elongated and gently curved ; lobes rounded or broadly obovate, flat, wavy-crisped, entire, or denticulate ; the two posterior lobes sometimes connate higher up than the rest, interior. *Stamens* 4, didynamous, inserted usually about or below the middle of the corolla-tube, included or scarcely exerted ; anthers approximating in pairs ; one theca perfect, acuminate, acute or mucronate at the base ; the other theca empty, long and subulate-acuminate, or rarely sub-obsolete. *Ovary* 2-chambered, with numerous ovules ; style bent downwards near the apex ; stigma oblong, club-shaped, or linguiform. *Fruit* an ovoid or conical somewhat compressed capsule, with loculicidal dehiscence ; valves entire or nearly so. *Seeds* very numerous, small, irregularly oblong, truncate.

Parasitic herbs, mostly drying black ; leaves scale-like, opposite or crowded, or the upper scattered ; inflorescence a spike or raceme ; flowers with bracts and bracteoles, large, brightly coloured or white.

Species about 30, natives of Africa and the Mascarene Islands ; 21 species in South Africa, fairly generally distributed.

7629

53. HYOBANCHE, Thunb.

Calyx 5-lobed ; lobes equal or unequal, one or two sometimes free. *Corolla* 3-lobed or -toothed ; tube clavate-cylindric or obovoid, exceeding the calyx ; the lobes forming a more or less distinct hood. *Stamens* 4, didynamous, inserted about or below the middle of the corolla-tube, included or exserted ; anthers approximating in pairs, 1-theous, rather large, pendulous, blunt or scarcely mucronate at the base. *Ovary* 2-chambered, with numerous ovules ; style inflexed above ; stigma thickly clavate or sub-globose, emarginate or somewhat bilobed. *Fruit* a sub-globose fleshy capsule, at length deliquescent. *Seeds* numerous, minute, globose.

Low parasitic herbs, fleshy or somewhat woody at the base ; leaves scale-like, scattered, ovate or oval, coloured, adpressed ; inflorescence a terminal spike ; flowers sessile or very shortly pedicelled, rather large, with bracts and bracteoles.

Endemic ; species 6, extending from Namaqualand to the Mossel Bay district ; also recorded from the Calvinia, Graaff-Reinet, and Somerset East districts and from Natal.

7646

54. BELLARDIA, All.

Calyx shortly 4-lobed, somewhat inflated. *Corolla* bilabiate ; tube about as long as the calyx-tube, with a palate in the throat ; upper lip galeate, entire, rather shorter than the lower, interior ; lower lip 3-lobed, with the middle lobe the smallest. *Stamens* 4, didynamous, lying in the hollow of the upper corolla-lip ; anthers all free, all fertile, 2-theous ; the thecae distinct, equal, parallel, mucronate at the base. *Ovary* 2-chambered, with numerous ovules ; style curved downwards near the apex ; stigma short, somewhat thickened, bifid. *Fruit* an ovoid somewhat compressed capsule, with loculicidal dehiscence. *Seeds* numerous, small, longitudinally ribbed.

Annual herbs, viscid-pubescent ; leaves opposite ; inflorescence a spike.

Species 2, natives of southern Europe, the Orient, and Africa ; 1 species in South Africa, extending from Namaqualand through the coastal districts to the Transkei ; also recorded from the Somerset East, Murraysburg, and Molteno districts.

164. BIGNONIACEÆ.

Flowers bisexual, more or less irregular. *Calyx* gamosepalous, truncate, lobed, or spathaceous. *Corolla* gamopetalous ; tube campanulate, funnel-shaped, or tubular, often pilose at the insertion of the stamens ; limb bilabiate, more rarely regular ; the 2-lobed posticous lip usually overlapping the 3-lobed anticus lip in bud. *Stamens* inserted on the corolla-tube and alternating with the lobes, 4, didynamous, sometimes with a posticous staminode, or 5 and equal, very rarely stamens 2 with 3 staminodes ; filaments filiform or flattened, slightly thickened at the base ; anther-thecae attached at the apex, parallel, divergent, or divaricate. *Disc* hypogynous, cushion-shaped, annular, or cupular, rarely absent. *Ovary* superior, 2-chambered or more rarely 1-chambered, with 2 parietal placentas ; ovules numerous, anatropous ; style simple, filiform ; stigmas of 2 flattened ovate

or oblong lobes. *Fruit* a 2-valved loculicidal or septifragal capsule, or fleshy, or indehiscent. *Seeds* usually flat, with a broad often hyaline wing, without endosperm.

Trees or shrubs, frequently twiners or climbers, very rarely herbs; leaves opposite, more rarely whorled or alternate, usually compound with articulated leaflets, often cirriferous; stipules absent, but closely simulated in certain genera by the first or first and second pairs of leaves of the axillary bud; inflorescence a panicle or raceme (simple or with cymose ultimate branching), terminal or axillary; flowers sometimes borne on the old wood, often large, abundant and brightly coloured.

Genera about 109; species about 670, mostly natives of tropical America.

Tribe **Tecomæ**: Ovary 2-chambered; fruit a loculicidal capsule; seeds winged (genera 1-5).

Tribe **Crescentiæ**: Ovary 1-chambered; fruit indehiscent; seeds not winged (genus 6).

- | | |
|---|---------------------------------|
| 1. Ovary 1-chambered; fruit indehiscent; seeds not winged | 6. <i>Kigelia</i> , DC. |
| Ovary 2-chambered; fruit a capsule; seeds winged | 2 |
| 2. Perfect stamens 5 | 3 |
| Perfect stamens 4, sometimes a staminode present | 4 |
| 3. Calyx tubular, slit on one side; capsule slightly compressed, with prickly warts | 4. <i>Catophractes</i> , D. Don |
| Calyx bell-shaped; capsule much compressed, smooth | |
| | 3. <i>Rhigozum</i> , Burch. |
| 4. Stamens exserted | 1. <i>Tecomeria</i> , Fenzl. |
| Stamens included | 5 |
| 5. Calyx spathe-like, split down one side; ovules in 4 rows in each chamber; trees | 5. <i>Markhamia</i> , Seem. |
| Calyx bell-shaped, inflated, equally 5-toothed; ovules in 8 rows in each chamber; climbing shrubs | 2. <i>Podranea</i> , Sprague |

7713

1. **TECOMARIA**, Fenzl.

Calyx regular, campanulate, 5-toothed. *Corolla-tube* narrowly funnel-shaped or almost cylindric, curved; limb markedly bilabiate. *Stamens* 4, exserted; anther-thecae connate above, divergent below. *Disc* cupular. *Ovary* 2-chambered, with the ovules 4-seriate in each chamber. *Capsule* oblong-linear, much compressed parallel to the septum.

Shrubs, erect or sometimes scandent; leaves opposite, simply imparipinnate; inflorescence a dense terminal raceme; flowers orange or scarlet.

Species 3, all African; 1 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district.

7716a

2. **PODRANEA**, Sprague

Calyx regular, campanulate, 5-toothed, inflated. *Corolla* campanulate above, narrowed to a cylindric tube below; limb slightly bilabiate; lobes sub-equal, spreading. *Stamens* 4, included; anther-thecae free except at the very apex, divaricate when mature. *Disc* cupular. *Ovary* 2-chambered, with the ovules 8-seriate in each chamber. *Capsule* linear, scarcely compressed.

Shrubs and undershrubs; leaves opposite, simply imparipinnate; inflorescence a terminal panicle; flowers pink or lilac.

Species 2, both African; 1 species in South Africa, recorded from Pondo'and.

7722

3. **RHIGOZUM**, Burch.

Calyx more or less regular, campanulate, 5-toothed. *Corolla* funnel-shaped or campanulate above, with a short cylindric tube below; limb sub-bilabiate; lobes 5, sub-equal, spreading. *Stamens* 5, all perfect; anther-

thecae connate above, free and parallel below. *Disc* saucer-shaped, lobed or entire. *Ovary* 2-chambered, contracted at the base, with the ovules 2-seriate in each chamber. *Capsule* oblong or elliptic-oblong, acuminate, much compressed parallel to the septum; valves smooth.

Erect much-branched spiny shrubs; leaves fascicled, simple, trifoliate, or pinnate; flowers solitary or fascicled on cushion-like contracted branches, salmon-coloured or white.

Species 9, all African; 4 species in South Africa, found in Bechuanaland, Griqualand West, the north-western and central districts, and extend to near Grahamstown.

7723

4. CATOPHRACTES, D. Don

Calyx tubular, shortly split down one side, terminated by 5 linear teeth. *Corolla* funnel-shaped, with a long cylindric tube; limb sub-labiate; lobes 5 (more rarely 6-7), spreading. *Stamens* as many as the corolla-lobes, all perfect, sub-included; anther-thecae connate above, free and parallel below. *Disc* cupular. *Ovary* 2-chambered, contracted at the base, with few ovules 2-seriate in each chamber. *Capsule* elliptic or elliptic-oblong, slightly compressed parallel to the septum; valves boat-shaped, woody, sharply warted.

Rigid shrubs, divaricately branched, with the leaves and calyx and fruit cano-tomentose or woolly; leaves simple, fascicled; flowers 2-4-nate at the end of the branches, sub-sessile.

Species 1; found in the Transvaal and South West Africa; also in tropical Africa.

7744

5. MARKHAMIA, Seem.

Calyx ovoid-acuminate or oblong, divided almost to the base. *Corolla-tube* cylindric, campanulate above; limb sub-2-lipped; lobes 5, entire, crenate, crisped, or incised. *Stamens* 4, included; anther-thecae at first often parallel, at length diverging or divaricate. *Disc* thick, pulvinate or annular. *Ovary* 2-chambered, sessile, with the ovules 4-seriate. *Capsule* oblong, subterete or compressed, straight or incurved, with loculicidal dehiscence; valves concave or flat.

Trees; leaves opposite, pinnate; inflorescence a simple raceme or a thyrsoid panicle.

Species about 12, natives of Africa, Asia, and Australia; 1 species in South Africa, recorded from the northern Transvaal.

7761

6. KIGELIA, DC.

Calyx large, campanulate, closed when in bud, bursting open into 2-3 irregular lobes. *Corolla* broadly campanulate, narrowed below into a straight cylindric or constricted tube; limb bilabiate; upper lip sub-erect, shortly 2-lobed; lower lip deflexed, deeply 3-lobed. *Stamens* 4, didynamous, with a posticous staminode, sub-exserted; anther-thecae free for the greater part of their length, slightly divergent. *Disc* large, annular. *Ovary* 1-chambered, with numerous ovules on 2 parietal placentas. *Fruit* roughly cylindric, indehiscent; pericarp thick, enclosing a fibrous pulp in which the seeds are embedded. *Seeds* thick, wingless, with a coriaceous much intruded testa.

Trees; leaves opposite, simply imparipinnate; inflorescence a pendulous long-peduncled lax panicle; flowers orange or red.

An African genus of about 12 species; 1 species extends into South Africa and is recorded from Delagoa Bay.

165. PEDALIACEÆ.

Flowers bisexual, zygomorphic. *Calyx* divided nearly to the base into 5 or 4 segments. *Corolla* gamopetalous; tube obliquely-campanulate, funnel-shaped, or cylindric, often gibbous or spurred at the base of the back; limb obscurely 2-lipped; lobes 5, sub-equal or unequal. *Stamens* 4, more or less distinctly didynamous, with the rudiment of the fifth present (very rarely 2 fertile and 2 staminodes), inserted on and enclosed in the corolla-tube and alternating with the lobes, rarely exserted; anther-thecae 2, hanging from the apex of the connective and often somewhat divergent, or dorsally attached to it and parallel; connective nearly always with an apical gland. *Disc* always more or less developed, annular or one-sided. *Ovary* superior, very rarely inferior, sessile, 2-4-chambered; chambers often completely or incompletely divided by spurious septa; style filiform, slightly exceeding the anthers; stigmas 2-lobed; ovule 1 or ovules more than 1 in each chamber, axile. *Fruit* very variable, dehiscent or indehiscent, often provided with spines or wings. *Seeds* 2 to many in each loculus; endosperm very thin.

Annual or perennial herbs, rarely shrubs or small trees, more or less covered with sessile mucilage glands (at least when young); leaves opposite, or the upper alternate, simple; stipules 0; flowers mostly axillary and solitary, rarely inflorescence a raceme; pedicels usually with nectarial glands at the base.

Genera about 14, with over 60 species, distributed in the tropics and the extra-tropical countries of the southern hemisphere of the Old World.

All the African members of the family belong to the Tribe *Pedaliaceæ*.

- | | |
|--|--|
| 1. Inflorescence racemose | 4. <i>Sigmatosiphon</i> , <i>Stapf</i> |
| Flowers solitary or fascicled in the axils of the leaves | 2 |
| 2. Corolla-lobes sub-equal; disc annular | 3 |
| Lowest corolla-lobe longer than the others; disc posterior | 5 |
| 3. Capsule oblong, with or without horns at the apex; ovules numerous in each division of the ovary-chambers | 4 |
| Fruit indehiscent, disc-shaped, with 2 conical spines; ovules 2 in each division of the ovary-chambers | 8. <i>Pretria</i> , <i>J. Gay</i> |
| 4. Fruit with 2 horns or spines at the apex | 7. <i>Ceratotheca</i> , <i>Endl.</i> |
| Fruit without horns or spines | 6. <i>Sesamum</i> , <i>Linn.</i> |
| 5. Corolla-tube more or less saccate or gibbous | 6 |
| Corolla-tube not saccate nor gibbous | 7 |
| 6. Corolla produced into a large sac at the base; ovary-chambers undivided, 8 ovules in each chamber in 2 series | 3. <i>Holubia</i> , <i>Oliv.</i> |
| Corolla slightly gibbous or saccate at the base; ovary-chambers unequal, divided by false septa; ovules unequal in number in the divisions | 5. <i>Rogeria</i> , <i>J. Gay</i> |
| 7. Fruit with 4 longitudinal wings, unarmed | 1. <i>Pterodiscus</i> , <i>Hook.</i> |
| Fruit with 2 rows of long horny arms, bearing recurved spines | 2. <i>Harpagophytum</i> , <i>DC.</i> |

7769

1. PTERODISCUS, Hook.

Calyx small, 5-partite. *Corolla* sub-bilabiate; tube funnel-shaped, oblique or slightly gibbous at the base; lobes 5, orbicular, sub-equal. *Stamens* 4, didynamous, inserted near the base of the corolla, included; anthers converging, with the thecae divergent. *Disc* slightly produced. *Ovary* 2-chambered, with the chambers undivided and with 1-2 ovules in each chamber from above the middle of the septum, or 10-12 in two series. *Fruit* indehiscent, laterally compressed, with 4 longitudinal wings, unarmed; pericarp spongy, with large cavities between the wings. *Seed* 1 or seeds 2 in each loculus, pendulous; testa finely honeycombed.

NN

Perennial succulent herbs ; stem tuberous at the base ; leaves opposite or alternate, coarsely toothed to pinnati-lacinate, rarely sub-entire ; flowers solitary, shortly pedicelled in the axils of the leaves, yellow or purple.

An African genus of about 15 species ; 2 species in South Africa, found in the Transvaal, parts of the O.F.S., and Griqualand West.

7771

2. HARPAGOPHYTUM, DC.

Calyx campanulate, 5-partite. *Corolla* 5-lobed ; tube funnel-shaped, equal or slightly gibbous ; lobes orbicular, sub-equal. *Stamens* 4, didynamous, fixed below the middle of the corolla-tube, included ; anther-thecae parallel, pendulous from the apex of the connective. *Disc* fleshy, dilated. *Ovary* 2-chambered, with the chambers undivided and having many ovules in 2 series attached to the septum. *Fruit* an ovoid or oblong 2-locular tardily dehiscent capsule, flattened at right angles to the septum, armed along the edges with 2 rows of long horny arms bearing recurved spines. *Seeds* numerous, obovate, horizontal.

Perennial herbs ; rootstock stout ; stems long, trailing ; leaves shortly petioled, opposite or alternate, divided ; flowers solitary on short pedicels in the axils of the leaves.

Species 3, all African ; 2 species in South Africa, found in the Transvaal, parts of the O.F.S., and Griqualand West.

7772

3. HOLUBIA, Oliv.

Calyx small, 5-partite. *Corolla* obscurely 2-lipped, 5-lobed ; tube cylindric at the middle, funnel-shaped at the mouth, produced posticously into a large sac at the base ; lobes sub-orbicular, sub-equal. *Stamens* 4, didynamous, inserted low down in the corolla-tube ; anthers dorsifixed, with the thecae parallel. *Disc* free, dilated, fleshy. *Ovary* 4-angled, 2-chambered, with the chambers undivided and with 8 ovules arranged in 2-series in each chamber. *Fruit* unknown.

A herb ; leaves palmati-nerved, more or less lobed ; flowers solitary in the axils of the leaves, greenish-yellow.

Endemic ; species 1, recorded from the Transvaal.

7775

4. SIGMATOSIPHON, Stapf

Calyx with a short tube and triangular lobes. *Corolla* fleshy, sub-bilabiate ; tube long-pilose within, naked in the throat ; lobes 5, ovate, obtuse. *Stamens* 4, sub-didynamous, inserted below the throat of the corolla, exserted ; anthers sagittate, with the thecae divergent. *Disc* equal-sided. *Ovary* cylindric, 2-chambered ; the chambers divided by a spurious septum almost to the apex ; ovules numerous in each chamber, 1-seriate. *Fruit* not seen.

A shrub with a short stem and papery bark ; branches glabrous, spiny ; branchlets abbreviated in the axils of the spines ; leaves obovate-cuneate ; flowers large, in racemes at the apex of the branches ; bracts and bracteoles small, at the base of the pedicel, sessile, deciduous.

Endemic ; species 1, found in South-West Africa.

7776

5. ROGERIA, J.Gay

Calyx small, 5-partite. *Corolla* obscurely 2-lipped ; tube funnel-shaped to almost cylindric, gibbous to saccate at the base ; lobes 5, sub-orbicular, sub-equal. *Stamens* 4, didynamous, inserted low down in the corolla-tube, included ; anthers dorsifixed, with the thecae parallel. *Disc* scarcely dilated. *Ovary* unequally 2-chambered ; one chamber much shorter and smaller ; anticus chamber divided imperfectly (in the lower part) ; posticus

chamber divided perfectly by a spurious septum; ovules numerous and about 4-seriate in each of the antieous, few and 1-seriate in the posticous divisions. *Capsule* obliquely-ovoid, rostrate, armed with 2-8 conical spines or tubercles; the larger anterior loculus tardily loculicidal to the middle; the posticous indehiscent. *Seeds* oblong, angular, reticulate.-

Erect annual succulent herbs; leaves opposite or alternate, broad, long-petioled; flowers in axillary few to 1-flowered cymes on short pedicels, violet or white.

Species 3, all African; 1 species found in Namaqualand and South-West Africa.

7777

6. SESAMUM, Linn.

Calyx 5-partite, usually sub-oblique. *Corolla* obscurely 2-lipped; tube obliquely campanulate; lobes 5, with the lowest lobe usually distinctly longer than the others. *Stamens* 4, sub-didynamous, inserted low down in the corolla-tube, included; anthers dorsifixed, with parallel thecae. *Disc* annular, equal. *Ovary* 2-chambered; the chambers divided by a spurious septum almost to the apex; ovules numerous, 1-seriate in each division. *Capsule* oblong, slightly compressed at right angles to the septum, more or less beaked, without any lateral appendage at the apex. *Seeds* numerous, compressed, obovate.

Annual or perennial erect or procumbent herbs; leaves opposite or alternate, petioled, or the upper sessile, polymorphic; flowers solitary in the axils of the leaves on mostly very short pedicels, pale pink to deep purple.

Species about 20, distributed throughout Africa and the Mascarene Islands, extending to the south of Europe and through the Orient to India, China, and Japan; 2 species in South Africa, found in the Transvaal, Natal, Griqualand West, and in some of the north-eastern and central districts.

7778

7. CERATOTHECA, Endl.

Calyx 5-partite, sub-oblique. *Corolla* obscurely 2-lipped; tube sub-campanulate; lobes 5; the lowest lobe by far the longest. *Stamens* 4, didynamous, inserted low down in the corolla-tube, included; anthers dorsifixed, with the thecae parallel. *Disc* annular, equal. *Ovary* 2-chambered; chambers mostly divided to the apex by a spurious septum; ovules numerous, 1-seriate in each division. *Capsule* oblong, compressed at right angles to the septum, produced into 2 short spreading horns at the apex. *Seeds* numerous, compressed, obovate.

Annual erect or procumbent herbs; leaves opposite or alternate, petioled; flowers on short pedicels, solitary in the axils of the leaves, rose-, lilac-, or yellow-coloured.

An African genus of 5 species; 1 species in South Africa, extending from the Transvaal into Bechuanaland and into Natal and Pondoland.

7780

8. PRETREA, J.Gay

Calyx 5-partite. *Corolla* sub-2-lipped; tube obliquely campanulate; lobes 5; the lowest lobe by far the longest. *Stamens* 4, didynamous, inserted low down in the corolla-tube, included; anthers dorsifixed, with the thecae parallel. *Disc* annular, equal. *Ovary* 2-chambered; chambers completely divided by a spurious septum; ovules 2 in each division. *Fruit* indehiscent, very hard, disc-shaped, with 2 conical spines from near the centre. *Seeds* 2 in each division.

Perennial trailing herbs; leaves opposite or alternate, deeply sinuate-toothed to lacinate; flowers solitary in the axils of the leaves, nodding, on long slender pedicels, rose-coloured to crimson.

Species 1, found in tropical and South Africa; recorded from the Transvaal and Bechuanaland.

166. MARTYNIACEÆ.*

Flowers bisexual, zygomorphic. *Calyx* 5-fid or 5-partite, slit in front. *Corolla* gamopetalous; tube scarcely gibbous; limb slightly 2-lipped; lobes 5, slightly unequal. *Stamens* 2, inserted on the lower part of the corolla-tube, included; staminodes 3. *Disc* regular. *Ovary* superior, 1-chambered, with 2 two-cleft parietal placentas and 4-16 descending inverted ovules; style long; stigmas 2, or stigma 2-lobed. *Fruit* 8-ribbed, 4-locular, ending in two long horns, opening loculicidally at the apex; exocarp leathery; endocarp hard. *Seeds* with thin endosperm.

Erect hairy herbs; leaves opposite or alternate, long petioled, cordate at the base, deeply sinuate-toothed or palmately lobed; inflorescence a short terminal raceme; flowers large; bracts small or 0; bracteoles at base of calyx 2, glandular.

Genus 1. with about 10 species; all American.

7784

1. MARTYNIA, Linn.

Characters of the Family. One or two species naturalised in South Africa.

167. OROBANCHACEÆ.

Flowers bisexual, irregular. *Calyx* gamosepalous, with 2-5 lobes or teeth, or divided into 2 lateral segments, bibracteolate at the base; lobes open or valvate in bud. *Corolla* gamopetalous, tubular; tube cylindric, ventricose or dilated above; limb more or less bilabiate; lobes imbricate, with the two back ones interior. *Stamens* 4, didynamous, without any rudiment of a fifth; filaments inserted below the middle of the corolla-tube, alternating with four of the lobes; anthers often connivent in pairs under the posterior corolla-lip or at the top of the tube, dorsifixed, 2-theccous; thecae usually equal and parallel, rarely one of the thecae empty, subulate-acuminate or broadly club-shaped. *Hypogynous disc* obscure, or rarely produced in the fruit into an ovoid or broad and short gland. *Ovary* superior, 1-chambered; carpels 2 or abnormally 3, placed front and back; placentas 4, parietal, covered almost all over with numerous anatropous ovules; style terminal, bilobed, papillose above. *Fruit* a 1-locular capsule, dehiscing by 2 placentiferous valves. *Seeds* very numerous, small, usually subglobose, foveolate-reticular or striate-rugose.

Herbs, parasitic on roots, usually thickened at the base and covered with imbricate scales; stems or scapes erect from the base, more or less scaly; leaves reduced to scales, alternate, the upper bract-like; flowers solitary in the axils of the bract-like scales, sessile or pedicellate, few or crowded in dense terminal spikes.

Genera about 12, with about 100 species, chiefly inhabiting Europe, North America, extra-tropical Asia, and north Africa.

7791

OROBANCHE, Tournef.

Calyx persistent, equally or unequally 2-5-toothed or 3-5-fid, or divided to the base at the back and front, with the lateral segments unequally bifid or rarely entire, a fifth smaller lobe being rarely added at the back; all the lobes or segments acuminate. *Corolla* more or less distinctly bilabiate;

* Hutchinson "Families of Flowering Plants" includes this under the Family Pedaliaceae.

upper lip bipartite, bifid, emarginate, or entire; lower lip 3-lobed; lobes separated by prominent folds. *Stamens* 4, didynamous, included; filaments usually thickened or flattened towards the base and usually surrounded with a gland above the point of attachment. *Ovary* ovoid or cylindric, furrowed. *Capsule* dehiscent in the median plane; valves often cohering by the persistent style. *Seeds* very numerous, sub-globose, minute.

Parasitic plants, usually more or less covered with gland-tipped papillose hairs; stems succulent, simple or branched; inflorescence a spike or raceme; flowers bracteate, with or without bracteoles.

About 150 species described, widely dispersed in the north temperate regions; 1 species in South Africa, found in the south-western districts.

168. GESNERIACEÆ.

Flowers bisexual, irregular or rarely regular. *Calyx* often gamosepalous, partly or quite adnate to the ovary, 5- (rarely 4-) toothed, lobed, or partite, with open valvate or rarely imbricate aestivation; sepals very rarely free to the base. *Corolla* gamopetalous; tube various; limb oblique or rarely sub-equal, often more or less 2-lipped; lobes 5, rarely 4, often imbricate, with the two posterior lobes interior or rarely exterior. *Stamens* 4 or 2, fixed to the base of the corolla or inserted on the tube, rarely some reduced to staminodes; anthers variously conniving, or connate, or rarely free, 2-theous; the thecae parallel, diverging, or divaricate, distinct or confluent at the apex. *Disc* hypogynous or perigynous, various. *Ovary* inferior, semi-inferior, or superior, 1-chambered, sometimes imperfectly 2- or 4-chambered, with numerous ovules; style simple; stigma terminal, dilated, capitate, or shortly 2-lobed. *Fruit* a capsule or rarely fleshy, crowned by the calyx-lobes, or included in the calyx, with loculicidal dehiscence or dehiscent variously. *Seeds* numerous, small, with or without endosperm.

Herbs or shrubs, rarely trees; stems in herbaceous forms short, simple, slightly branched or almost none; in shrubby and tree forms stems erect, scandent, or creeping; leaves opposite, sometimes alternate, radical or grouped at the end of short branches; stipules none; inflorescence various; bracts small or rarely foliaceous; bracteoles rarely present on the pedicels.

Over 70 genera, with about 700 species, widely distributed.

7823

1. STREPTOCARPUS, Lindl.

Calyx usually deeply 5-fid. *Corolla* asymmetric; limb 5-lobed, 2-lipped, sometimes a little irregular, sometimes the 3-lobed lip much the longer. *Stamens* 2, inserted on the corolla-tube, sometimes 2 or 3 staminodes present; anther-thecae early confluent. *Ovary* cylindric, 1-chambered, with numerous ovules, hairy or densely glandular (in all the South African species); placentas much intruded; style linear-cylindric; stigma sub-capitate. *Capsule* linear, long, splitting into 2 spirally twisted valves which separate from the placentas. *Seeds* very small, ellipsoid or oblong.

In the South African species all herbs, usually nearly or quite stemless, with many-celled often gland-tipped hairs; inflorescence a pedunculate cyme or rarely only 2-flowered; bracts small or 0.

Species about 50, confined to Africa south of the tropic of Cancer, and the Mascarene Islands; 22 species in South Africa, extending from the Transvaal, Zululand, Natal, the eastern O.F.S., as far south as Knysna.

169. LENTIBULARIACEÆ.

Flowers bisexual, zygomorphic. *Calyx* deeply 2-5-partite, regular or more or less 2-lipped, or the sepals free to the base. *Corolla* gamopetalous, 2-lipped, spurred, rarely saccate; tube very short; upper lip interior, entire or 2-lobed; lower entire or 2-3-lobed, usually with a vaulted, more or less 2-gibbous, palate. *Stamens* 2, anticus, attached to the base of the corolla; filaments asymmetrically thickened; anthers 2-theous, with diverging thecae. *Ovary* superior, 1-chambered, with numerous sessile and closely packed ovules, rarely ovules few or only 2; style simple; stigma more or less distinctly 2-lipped, with the upper lip usually very small and obscure. *Fruit* a 1-locular few to many-seeded capsule, dehiscing irregularly, or by 2-4-valves, or circumscissile, very rarely 1-seeded and indehiscent. *Seeds* very small, without endosperm.

Perennial, rarely annual, herbs, aquatic or terrestrial (but always in wet places), with peculiar, usually utricular, contrivances for the capture and digestion of small organisms; leaves rosulate or scattered on stolons, entire or divided, uniform, or sometimes heteromorphic; inflorescence a terminal or axillary simple peduncled raceme, rarely sparingly branched, bracteate; lowest bracts usually barren, adpressed; bracteoles 2 at the base of the pedicels, or 0; flowers very small to large, often showy, yellow, purple, or blue.

Genera 4, with about 200 species, occurring in temperate and tropical regions.

Calyx of 2 sepals; utricles bladder-like, ovoid or globose

2. *Utricularia*, Linn.

Calyx deeply 5-partite; utricles tubular, with 2 spirally twisted

arms 1. *Gentisea*, St. Hil.

7899

1. GENLISEA, A. St. Hil.

Calyx deeply 5-partite. *Corolla* 2-lipped, spurred; upper lip erect, entire or emarginate; lower lip larger than the upper, with a vaulted more or less 2-gibbous palate and a deflexed 3-lobed margin. *Filaments* short; anther-thecae sub-distinct or confluent. *Ovary* more or less globose, 1-chambered, with numerous ovules; style short or very short; stigma 2-lipped; one lobe larger than the other. *Capsule* usually globose, circumscissile or breaking up irregularly. *Seeds* ovoid, often very oblique.

Rootless terrestrial herbs, growing in swamps, with peculiar pitcher-like organs for the capture and digestion of small organisms; primary axis terminated by an inflorescence, producing at the base often very dense rosettes of leaves, frequently root-like organs, the latter from the axis or the base of axillary buds; leaves heteromorphic; foliage leaves petioled, entire, spatulate to sub-orbicular, persistent at the time of flowering; pitcher leaves consisting of a stalk and a slender tube, cylindric from an ellipsoid base and passing into 2 long ribbon-like spirally twisted arms; the arms and the tube provided on the inner side with transverse bands of stiff reversed hairs; inflorescence racemose, bracteate, peduncled; lower bracts usually barren, adpressed; bracteoles 2, at the base of the pedicel.

Species about 7-8, found in tropical Africa and tropical South America; 1 species in South Africa, recorded from the Transvaal and Natal.

7901

2. UTRICULARIA, Linn.

Sepals 2, free or united at the base. *Corolla* 2-lipped, spurred or rarely saccate; upper lip erect, entire, or emarginate to bifid; lower lip usually much larger than the upper, usually with a vaulted often much raised and 2-gibbous palate and a spreading or deflexed entire crenulate or lobed margin. *Filaments* short; anther-thecae sub-distinct or quite confluent.

Ovary more or less globose, 1-chambered, with numerous ovules ; style short ; stigma 2-lipped, one lobe much larger than the other which is often obscure. *Fruit* a capsule, breaking up into 2 valves or dehiscing irregularly. *Seeds* usually very small, variously shaped.

Rootless aquatic or terrestrial or epiphytic herbs, nearly always provided with minute bladder-like organs for the capture and digestion of small organisms ; stolons floating in still water, or creeping on mud, rarely attached to stones and rocks in running water ; leaves petioled, normally always entire, linear or orbicular or reniform, rarely peltate, often decayed at the time of flowering ; in the aquatic forms the leaves are more or less divided into filiform or capillary segments ; inflorescence a peduncled raceme, bracteate, those of certain aquatic forms held above water by a whorl of modified spongy leaves ; bracteoles 2, at the base of the pedicel, or 0.

Species, over 100 mainly massed in the tropics of both hemispheres ; 12 species in South Africa, fairly generally distributed.

170. ACANTHACEÆ.

Flowers bisexual, irregular or sub-regular. *Calyx* 4- or 5-partite, mostly nearly to the base, very rarely 2-lipped. *Corolla* gamopetalous, 2-lipped, 1-lipped, or 5-lobed. *Stamens* inserted on the corolla and alternating with the lobes, usually 4 and didynamous, or 2, with or without staminodes ; anther-thecae 2 or 1, rounded, acute or tailed at the base, parallel, of equal heights, or one theca more or less below the other. *Disc* various or inconspicuous. *Ovary* superior, 2-chambered, with usually 2 ovules in each chamber, rarely ovule only 1 or ovules 3 or more ; style long, simple, entire, 2-fid, or one lobe smaller or obsolete. *Capsule* loculicidal, often elastically dehiscent ; in a few genera the placentas remain attached to the top of the capsule and spring up elastically from the base. *Seeds* usually as many as the ovules, or sometimes fewer by abortion, smooth, rugose, tubercled, or covered with hygroscopic hairs.

Herbs or shrubs, sometimes climbing ; leaves opposite, caudate, rarely radical, nearly always simple, entire ; stipules 0 ; inflorescence very various, spicate, cymose, paniced, or flowers in heads, clusters, or solitary ; bracts large, small, or 0 ; bracteoles 2, large or small, exceeding or shorter than the calyx, sometimes minute, or 0.

Genera 177 ; species about 2,000, abundant in the tropics ; frequent in temperate climates ; absent in cold regions ; represented in Europe by only 3 or 4 species of *Acanthus* which reach the Mediterranean.

Tribe **Thunbergiæ** : Corolla not, or obscurely, 2-lipped ; lobes contorted in bud, *i.e.* no lobe wholly within or without the others ; ovules 2 in each ovary-chamber, collateral ; capsule beaked ; seeds orbicular, without retinacula (genus 1).

Tribe **Ruellieæ** : Corolla-lobes contorted in bud ; stamens 4, very rarely 2 ; anther-thecae at nearly equal heights ; calyx or bracteoles often conspicuous ; seeds discoid, covered, at least on the margins, with numerous fine white hairs which spring out on applying water (genera 2-8).

Tribe **Acantheæ** : Corolla 1-lipped ; tube short ; stamens 4 ; anthers 1-theccous ; pollen ellipsoid, longitudinally banded ; ovules 2 (or 1) in each ovary-chamber (genera 12-16).

Tribe **Justicieæ** : Corolla-limb sub-equally 5-lobed or 2-lipped ; in the bud one lobe wholly within and one lobe wholly without ; ovules 2 or ovule 1, very rarely 3, in each ovary-chamber (genera 9-11, 17-29).

1. The two lower filaments 2-fid near the top, one branch distinct or nearly obsolete, the other bearing the anther ; ovary with 2 hollows on the upper side filled with glands . . . 13. *Blepharis*, *Juss.*
Filaments not divided at the apex ; ovary without any hollows filled with glands 2

2. Corolla with a palate in the throat 3
- Corolla without a palate in the throat 5
3. Corolla hairy ; one anther-theca below the other 29. *Justicia*, *Linn.*
- Thecae of anthers at same height 4
4. Corolla-tube much longer than the limb ; anther-thecac mucronate
or spurred at the base 23. *Siphonoglossa*, *Oerst.*
- Corolla-tube shorter than the limb ; anther-thecae sometimes ob-
scurely mucronate at the base, never spurred 25. *Duvernoya*, *E. Mey.*
5. Calyx truncate or 10-14-toothed 1. *Thunbergia*, *Linn. f.*
- Calyx 4- or 5-toothed, -lobed, or -partite 6
6. Calyx divided into 4 segments 7
- Calyx divided into 5 segments 10
7. Corolla 1-lipped 8
- Corolla 2-lipped, if equally or sub-equally 5-lobed then stamens 2 9
8. The two lower sepals connate nearly to the tip, 10-nerved : the
upper sepals 11-nerved 15. *Acanthopsis*, *Harv.*
- The lower sepal 2-4-nerved, entire or 2-toothed ; the upper 3-5-
nerved, entire 14. *Acanthus*, *Linn.*
9. Stamens 2 11. *Barleria*, *Linn.*
- Stamens 4 2. *Hygrophila*, *R.Br.*
10. Corolla equally or sub-equally 5-lobed, if obscurely 2-lipped then
style hairy or bracteoles 0 11
- Corolla 2-lipped or 1-lipped 18
11. Ovules 3 or more in each ovary-chamber 12
- Ovules 2 in each ovary-chamber 13
12. Bracteoles longer than the calyx ; calyx 2-lipped ; style glabrous
8. *Ruellia*, *Linn.*
- Bracteoles shorter than the calyx ; calyx 5-fid ; style hairy
7. *Ruellia*, *Linn.*
13. Bracteoles very large, prominently veined 4. *Petalidium*, *Nees*
- Bracteoles smaller than the calyx, minute, or 0, very rarely a little
if so then not prominently veined and one anther-theca a little
below the other 14
14. Calyx-lobes unequal 3. *Phaulopsis*, *Willd.*
- Calyx-lobes or -segments equal 15
15. Seeds covered with hygroscopic hairs ; style hairy 16
- Seeds without hygroscopic hairs ; style glabrous 17
16. Stamens 4, sub-similar 5. *Dyschoriste*, *Nees*
- Stamens 2, with 2 small staminodes 6. *Chaetacanthus*, *Nees*
17. Stamens 4 17. *Asystasia*, *Blume*
- Stamens 2 21. *Mackaya*, *Harv.*
18. Corolla 1-lipped 19
- Corolla 2-lipped 20
19. Bracteoles shorter than the calyx ; seeds without hygroscopic
hairs 12. *Sclerochiton*, *Harv.*
- Bracteoles longer than the calyx ; seeds covered with hygroscopic
hairs 16. *Crossandra*, *Salisb.*
20. Anthers 1-theous 21
- Anthers 2-theous 22
21. Inflorescence a dense terminal panicle ; petioles disarticulating at
the base leaving small cup-like scars 26. *Ruttya*, *Harv.*
- Flowers in spikelets arranged in cymes, heads, or spikes, terminal or
axillary 20. *Hypoestes*, *R.Br.*
22. Calyx divided to about the middle 28. *Himantochilus*, *T.And.*
- Calyx divided to the base 23
23. Anther-thecae at equal heights, if one a little below the other then
the ovary hairy 24
- One anther-theca completely above the other 27
24. Bracts and bracteoles small, linear, or bracteoles 0 25
- Bracts large 26

- | | |
|--|---------------------------------------|
| 25. Stamens 4 | 9. <i>Glossochilus</i> , <i>Nees</i> |
| Stamens 2 | 24. <i>Rhinacanthus</i> , <i>Nees</i> |
| 26. Stamens 4 | 10. <i>Crabbea</i> , <i>Harv.</i> |
| Stamens 2 | 22. <i>Ecbolium</i> , <i>Kurz.</i> |
| 27. Flowers solitary or 2-nate in the axils of the bracts | 19. <i>Dictiptera</i> , <i>Juss.</i> |
| Inflorescence paniculate | 28 |
| 28. Corolla-lips sub-entire ; inflorescence a panicle of spikelets usually containing 1 perfect and 1 imperfect flower | 18. <i>Peristrophe</i> , <i>Nees</i> |
| Lower lip of corolla with 3 oblong or ovate lobes ; flowers not in spikelets | 27. <i>Isoglossa</i> , <i>Oerst.</i> |

7914

1. THUNBERGIA, Linn. f.

Bracteoles 2, large, elliptic or ovate. *Calyx* much shorter than the bracteoles, either sub-truncate or with 10-14 small linear teeth. *Corolla* 5-lobed ; tube oblique, more or less widened above ; lobes rounded, spreading, contorted in the bud. *Stamens* 4, didynamous, inserted near the base of the corolla ; connective often produced at the top as a short horn ; anthers nearly similar, 2-theccous, often spurred at the base and with bearded hairs. *Disc* pulvinate or shortly annular. *Ovary* ovoid, acute, with 2 ovules in each chamber. *Capsule* globose, abruptly rostrate, loculicidally dehiscent. *Seeds* 2 in each loculus, inserted near the base, sub-hemispheric or flattened.

Herbs, rambling, twining, or scandent, or small and sub-erect ; leaves ovate, lanceolate, cordate or hastate ; inflorescence a terminal raceme, or (in all the South African species) the flowers pedicellate, axillary and solitary.

Species about 100, found in S.E. Asia, Africa, and the Mascarene Islands ; 17 species in South Africa, extending from the Transvaal and Natal to the Cape ; also recorded from the Somerset East district.

7926

2. HYGROPHILA, R.Br.

Bracts large, oblong ; bracteoles shorter than the calyx. *Calyx* 5-fid (in the South African species 4-fid). *Corolla* 2-lipped ; the upper lip erect, concave, 2-toothed or shortly 2-fid ; the lower lip 3-lobed ; lobes contorted in the bud. *Stamens* 4, fixed below the middle of the corolla-tube ; the posterior stamen often small or aborted ; anther-thecae 2, mucinous. *Disc* inconspicuous. *Ovary* with 3 or more ovules in each chamber. *Capsule* narrow-oblong, seed-bearing from the base. *Seeds* usually very numerous (2-8 in the South African species), with hygroscopic hairs.

Erect or diffuse herbs, unarmed or with axillary spines ; leaves entire ; flowers packed in dense axillary cluster, surrounded (in the South African species) by strong spines, or the flowers rarely solitary.

Species about 20, widely spread in the tropics ; 1 species in South Africa, found in the northern Transvaal.

7932

3. PHAULOPSIS, Willd.

(Phaylopsis, Willd.)

Bracteoles 0. *Calyx* 5-lobed nearly to the base ; the 2 lower segments linear or linear-spathulate ; the upper segment ovate ; the 2 inner segments shorter, linear. *Corolla* small, 5-lobed ; lobes contorted in the bud. *Stamens* 4, inserted below the corolla-throat, included ; anther-thecae mucronate at the base. *Disc* somewhat conspicuous. *Ovary* with 2 ovules in each chamber ; style thinly hairy ; one stigmatic arm linear-oblong, the other very short. *Capsule* ellipsoid, compressed, solid at the base, usually perfecting 4 seeds, dehiscing elastically ; the placentas (carrying the seeds) separate from the capsule-wall and spring up from the bottom. *Seeds* with numerous hygroscopic hairs on the margins.

Small shrubby plants; leaves often oblique, those in one opposite pair unequal, elliptic, entire or crenate; inflorescence a cylindric or ovoid spike, each broad floral leaf enclosing a contracted cyme of usually 3 flowers; bract to each flower 0.

Species about 15, natives of Africa, the Mascarene Islands, and India; 2 species in South Africa, found in Natal.

7934

4. PETALIDIUM, Nees

Bracteoles 2, very large, ovate or elliptic, ultimately more or less scarious, prominently veined, larger than the calyx. *Calyx* deeply divided into 5 unequal narrow-lanceolate segments. *Corolla* 5-lobed; tube dilated towards the top; lobes rounded, sub-equal, contorted in the bud. *Stamens* 4, inserted below the middle of the corolla-tube, included; anther-thecae mucronate at the base. *Ovary* with 2 ovules in each chamber; style with 2 unequal branches. *Capsule* small, ellipsoid, compressed, dehiscing with elasticity; the placentas separate from the capsule-wall and spring up from the base. *Seeds* 4 (or more often 2), with many hygroscopic hairs.

Small shrubs; leaves entire; inflorescence of contracted monopodial cymes, often reduced to single flowers (as nearly always in the South African species); bract small or 0.

Species about 18, natives of Africa, the Mascarene Islands, and India; 2 species in South Africa, recorded from the Transvaal and S.W. Africa.

7939

5. DYSCHORISTE, Nees

Bracteoles 2, linear or narrow-oblong, much shorter than the calyx. *Calyx* 5-toothed, divided for $\frac{1}{2}$ – $\frac{3}{4}$ of its length; teeth linear. *Corolla* 5-lobed, obscurely or distinctly 2-lipped; tube narrowly cylindric, or sub-campanulate above; lobes obovate or rounded, equally contorted, or the upper connate high up. *Stamens* 4, sub-similar, included or sub-exserted; anther-thecae 2, at equal heights usually spurred at the base. *Ovary* with 2 ovules in each chamber; style hairy; one stigmatic arm linear-oblong, the other suppressed. *Capsule* linear-cylindric, hardly clavate, solid at the base, usually perfecting 4 seeds. *Seeds* discoid, densely clothed with hygroscopic white hairs.

Small shrubs; leaves entire or obscurely crenate, often fascicled; flowers sub-sessile, axillary, clustered, or scattered and solitary.

Species about 60, distributed in North and tropical America, tropical Asia, and Africa; 5 species in South Africa, found in the Transvaal and Natal.

7941

6. CHAETACANTHUS, Nees

Bracteoles 2, linear or oblong, much shorter than the calyx. *Calyx* 5-toothed, divided for $\frac{1}{2}$ – $\frac{3}{4}$ of its length; teeth linear. *Corolla* 5-lobed; tube linear nearly to the top; lobes sub-equal, contorted in bud. *Stamens* 2, with 2 small staminodes; anther-thecae at equal heights. *Ovary* with 2 ovules in each chamber; style linear, thinly hairy; stigma with 1 linear-oblong branch, the other branch suppressed. *Capsule* linear-cylindric, generally perfecting 4-seeds. *Seeds* discoid, covered with hygroscopic hairs.

Small shrubs; leaves entire; flowers axillary, solitary or few together.

Endemic: species 4, extending from the Transvaal and Natal to the Mossel Bay district; also recorded from the Somerset East district.

7946

7. RUELLIOPSIS, C.B.Cl.

Bracteoles 2, linear, shorter than the calyx. *Calyx* deeply divided; segments 5, linear, unequal. *Corolla* 5-lobed; tube funnel-shaped; segments sub-equal, contorted in bud. *Stamens* 4, sub-similar; anther-thecae 2,

oblong, spurred at the base. *Ovary* with 4 ovules in each chamber; style hairy, with 1 linear and 1 suppressed stigmatic branch. *Capsule* cylindric, 8-seeded from the base. *Seeds* hygroscopically hairy on the margin.

Small shrubs; leaves linear; flowers solitary, axillary.

Species 3; 2 in tropical Africa, 1 in South Africa, recorded from the Transvaal, Bechuanaland, and from Grahamstown.

7965

8. RUELLIA, Linn.

Bracteoles 2, oblong or spatulate-elliptic, longer than the calyx. *Calyx* 5-fid, or 5-partite almost to the base, regular or 2-lipped. *Corolla* 5-lobed; tube various; lobes equal or the 2 upper approximating into a lip, or connate to the base. *Stamens* 4, fixed below the throat of the corolla-tube, exerted or included; anther-thecae 2, parallel, muticous. *Disc* often slightly conspicuous. *Ovary* with 3 or more ovules in each chamber; style with one linear-oblong branch, the other branch suppressed. *Capsule* cylindric, narrowed and solid at the base, usually perfecting more than 4 seeds in the clavate upper part. *Seeds* on prominent retacula, with many hygroscopic hairs on their margins.

Undershrubs; leaves nearly or quite entire; flowers axillary, solitary, or few and clustered.

Species about 150, mostly tropical American, a few in North and South America, Africa, and the warmer parts of Asia and Australia; 7 species in South Africa, extending from the Transvaal and Natal to Swellendam; also found in Bechuanaland.

7970

9. GLOSSOCHILUS, Nees

Bract a reduced upper leaf; bracteoles 0. *Calyx* 5-partite to the base. *Corolla* 2-lipped; tube gradually enlarged from the base, much swollen at the top; lower lip 3-lobed, with the central lobe ovate, twice as broad as the lateral. *Stamens* 4, attached to the middle of the corolla-tube; anther-thecae 2, one much below the other, both minutely mucronate at the base. *Disc* shortly cup-shaped. *Ovary* with 2 ovules in each chamber, glabrous except near the style-base; style branches 2, sub-equal. *Capsule* narrowly-ellipsoid, shortly stalked, 4-seeded. *Seeds* much flattened, smooth, with the thickened margins without hairs.

A small shrub; leaves narrow, glabrescent; flowers solitary, axillary, a few approximated towards the ends of the branches.

Endemic; species 1, found in Griqualand West and Bechuanaland.

7972

10. CRABBEA, Harv.

Bracts large, ovate or oblong, often partly spine-toothed; bracteoles 0. *Calyx* 5-partite nearly to the base; segments linear, aristate, with long unicellular hairs. *Corolla* 2-lipped; tube cylindric, widened upwards; lower lip 3-lobed, folded down over the other in bud. *Stamens* 4, sub-similar, attached to the corolla-tube below the middle, included; anthers 2-theous, at nearly equal heights, muticous at the base. *Disc* annular or shortly cup-shaped. *Ovary* with 2-4 ovules in each chamber; style articulated on the ovary, with a short oblong stigmatic plate, the other plate absent. *Capsule* narrow-oblong, 8-4-seeded. *Seeds* discoid, covered with hygroscopic hairs.

Low shrubs, hairy or glabrous; leaves entire; inflorescence a dense compound axillary or peduncled head.

An African genus of about 10 species; 6 species in South Africa, extending from the Transvaal and Natal to the Humansdorp district; also recorded from Griqualand West.

7973

11. BARLERIA, Linn.

Bracts spine- or leaf-like, entire, toothed, or pinnatifid, a second sterile bract often present; bracteoles 0. *Calyx* large, 4-fid; the lowest segment of 2 sepals united nearly or frequently quite to the tip, with 1 mid-nerve; the upper segment of nearly equal length, rather narrower; the 2 inner segments much smaller. *Corolla* 2-lipped or sub-equally 5-fid; tube cylindrical. *Stamens* 2, perfect, often with 2 rudimentary stamens, attached near the base of the corolla-tube; anthers 2-theous, parallel, at equal heights. *Disc* inconspicuous. *Ovary* with 2 ovules (or 1) in each chamber; stigmas 2, short, or sub-confluent. *Capsule* either ovoid and 2-seeded, or ellipsoid and 4-seeded, flattened, sometimes (when 2-seeded) beaked. *Seeds* large, shaggy with hygroscopic hairs.

Herbs or shrubs, glabrous, pubescent, or tomentose; leaves entire; inflorescence an axillary scorpioid cyme, sometimes forming dense 1-sided many-flowered strobilate spikes, sometimes reduced to 3-2-flowered clusters, or (apparently) solitary flowers; the axillary quasi-solitary flowers again not rarely running into terminal heads or spikes.

Species about 120, mostly in Africa and tropical Asia, a few in America; 26 species in South Africa, fairly widely distributed, but in the coastal districts do not extend west of Riversdale.

7978

12. SCLEROCHITON, Harv.

Bracts elliptic or obovate, obtuse, entire; bracteoles 2, oblong, shorter than the calyx. *Calyx* 5-partite; the segments unequal. *Corolla* 1-lipped; tube short; lip obovate, 5-lobed. *Stamens* 4, fixed to the corolla-throat, shorter than the lip; anthers 1-theous, shortly hairy at the base, or glabrous. *Disc* inconspicuous. *Ovary* with 2 ovules (or 1) in each chamber; style shortly 2-fid. *Capsule* oblong, hard, scarcely compressed. *Seeds* 4, or fewer by abortion, without hygroscopic hairs.

Glabrous undershrubs; leaves entire; flowers axillary, solitary, or in spikes at the ends of the branches.

Species 9, all African; 1 species in South Africa, recorded from the Transvaal, Natal, Pondoland, and the Transkei; also recorded from the Somerset East district.

7980

13. BLEPHARIS, Juss.

Bracts large, strongly nerved, often spine-toothed; bracteoles 2, narrow, or rarely 0. *Calyx* 4-partite nearly to the base; the front segment of 2 sepals united nearly to the tip; the back sepal longer, ovate at the base, 3-nerved; the 2 inner sepals much shorter and narrower. *Corolla* 1-lipped; tube short; lip nearly flat, obovate, with 3-5 rounded lobes. *Stamens* 4, inserted in the throat of the corolla, shorter than the lip; the 2 front filaments 2-fid near the top, one branch carrying the anther, the other branch distinct or nearly obsolete. *Anthers* 1-theous, ciliate. *Disc* annular, somewhat conspicuous. *Ovary* with 2 (or 1) ovules in each chamber, with 2 hollows on one side filled with glands; style-branches 2, unequal. *Capsule* ellipsoid, flattened, woody, 2-(rarely 4-) seeded. *Seeds* much flattened, covered with rope-like hair bundles.

Woody undershrubs, often spinous or with spine-toothed hairs; leaves of the main stem approximated, frequently in fours; the lower pair in each false whorl often smaller and sometimes reduced to compound spines; inflorescence a spike of various forms, sometimes reduced to a single flower surrounded by 4-8 empty bracts.

Species about 50, mostly African; a few extending through Arabia and the Orient Region to India; about 30 species in South Africa, fairly generally distributed; not recorded west of the Riversdale district.

7981

14. ACANTHUS, Linn.

Bracts sometimes large, spinous-toothed, or smaller and entire, rarely obsolete; bracteoles narrow, entire or spinous-toothed. *Calyx* 4-partite; the lower segment 2-4-nerved, entire or 2-toothed; the upper segment 3-5-nerved, entire; the 2 outer segments large. *Corolla* 1-lipped; tube short; lip 3-5-lobed. *Stamens* 4, inserted in the corolla throat, shorter than the lip; anthers 1-theous, bearded. *Disc* obsolete. *Ovary* with 2 ovules in each chamber; style very shortly 2-fid. *Capsule* ovoid or oblong, compressed. *Seeds* 4, or fewer by abortion.

Spinous herbs or shrubs; leaves sometimes radical, sinuate-toothed or pinnatifid, with the teeth spiny, rarely sub-entire; inflorescence a spike, terminal, dense or interrupted; flowers opposite or alternate in the axils of the bracts.

Species about 10, found in the Mediterranean Region, south-east Asia, and Polynesia; 1 species occurs in South Africa as an introduction.

7982

15. ACANTHOPSIS, Harv.

Bracts incised or spinous-toothed. *Calyx* 4-partite; the 2 lower sepals connate nearly to the tip, 10-nerved; the upper sepals 11-nerved. *Corolla* 1-lipped; tube short; lip obovate-oblong, 5-lobed; the lowest lobe the largest. *Stamens* 4, inserted in the corolla-throat, shorter than the lip; anthers 1-theous, ciliate. *Ovary* with 2 ovules in each chamber; style with 1 linear branch, the other branch very small or 0. *Capsule* ovate or orbicular, compressed, thick. *Seeds* 4, or 2 by abortion, covered with hygroscopic hairs.

Small shrubs, spinous; leaves sometimes radical, toothed, spinous; inflorescence a dense spike.

Endemic; species 7, found in Namaqualand and Griqualand West.

7985

16. CROSSANDRA, Salisb.

Bract large, ovate; bracteoles linear, nearly as long as the bract, longer than the calyx. *Calyx* 5-partite to the base; the 2 lower segments acute, 1-nerved; the uppermost segment broader, 2-nerved, often 2-toothed; the 2 innermost segments lanceolate, rather shorter. *Corolla* 1-lipped; tube narrow, cylindric, slightly widened at the throat. *Stamens* 4, sub-similar, attached to the middle or high up on the corolla-tube, included; anthers 1-theous. *Disc* inconspicuous. *Ovary* oblong, with 2 ovules in each chamber; stigma obscurely 2-fid. *Capsule* oblong-ellipsoid, usually 4-seeded, or seeds fewer by abortion. *Seeds* with fringed scales, or tufts of hairs which are slightly hygroscopic.

Shrubs or undershrubs, or with herbaceous stems from a woody rootstock; leaves entire; inflorescence a dense spike.

Species about 14, natives of Africa and the Mascarene Islands; 1 species extends to India; 1 species in South Africa, recorded from the Transvaal and Natal.

8007

17. ASYSTASIA, Blume

Bracts usually small, rarely large; bracteoles minute or 0, or in one species longer than the calyx. *Calyx* 5-partite to the base; segments linear, equal. *Corolla* 5-lobed, not or obscurely 2-lipped; tube linear or narrow-cylindric below, much inflated above (except in 1 species); segments 5, sub-equal; the lowest wholly outside in the bud. *Stamens* 4, perfect, sub-similar, attached below the corolla-throat, included; anthers 2-theous, at equal heights, or one a little lower than the other, mucous or minutely tailed at

the base. *Disc* annular or shortly cup-shaped. *Ovary* with 2 ovules in each chamber ; stigmas 2, very small, sub-equal. *Capsule* 4-seeded at the top of a long solid stalk, flattened laterally. *Seeds* flattened, wrinkled or tubercled.

Herbs or shrubs ; leaves entire, wavy or irregularly toothed on the margin ; inflorescence a terminal spike, or a thyrsoid often one-sided panicle ; flowers solitary or fascicled, sessile or shortly pediceled.

Species about 35, natives of Africa, east India, and the Malay Archipelago ; 6 species in South Africa, extending from the Transvaal and Natal into Pondoland, with a record from the Fort Beaufort and Ceres districts.

8026

18. PERISTROPHE, Nees

Bracts 2, linear or oblong-lanceolate ; bracteoles 2, more or less equalling the bracts, longer than the calyx. *Calyx* 5-partite almost to the base ; segments linear-lanceolate. *Corolla* 2-lipped ; tube narrow, hardly widened above ; the upper lip erect and somewhat concave, entire or emarginate ; the lower lip spreading, somewhat convex or flat, entire or 3-fid. *Stamens* 2, inserted in the corolla-throat, slightly shorter than the lips of the corolla ; anthers 2-theous, with the thecae muticous and one much above the other. *Disc* cup-shaped. *Ovary* with 2 ovules in each chamber ; style with 2 very short oblong branches. *Capsule* oblong, on a cylindric stalk, 4-seeded, or seeds fewer by abortion ; placentas not rising elastically from the base. *Seeds* sub-orbicular, compressed, often tubercled.

Herbs ; leaves entire ; inflorescence a panicle of spikelets which usually contain 1 perfect and 1 imperfect flower.

Species about 20, found in Africa, Madagascar, east India, China, and the Malay Archipelago ; 5 species in South Africa, extending from Natal to the Uitenhage district ; also recorded from the Somerset East district and S.W. Africa.

8031

19. DICLIPTERA, Juss.

Bracts 2, much longer than the calyx ; bracteoles 2, linear. *Calyx* 5-fid to the base ; segments linear, hairy. *Corolla* 2-lipped ; tube linear-funnel-shaped ; the upper lip erect, concave, entire or emarginate ; the lower lip entire or very shortly 3-lobed. *Stamens* 2, inserted in the corolla-throat, slightly shorter than the lips ; anthers 2-theous, muticous, with one theca much below the other. *Disc* cup-shaped, truncate, oblique, or sinuate-toothed. *Ovary* with 2 ovules in each chamber ; style with 2 sub-equal very short lobes. *Capsule* ovoid, very much flattened laterally, 4-seeded ; the placentas rising elastically from the base of the capsule-valves. *Seeds* sub-orbicular, rough or tubercled.

Herbs ; leaves entire ; flowers solitary or 2-nate in the axils of the bracts, forming spikelets which are solitary, clustered, or capitate.

Species about 60, natives of Africa, tropical America, Asia, sub-tropical Japan, Australia, and the Pacific Islands ; 7 species in South Africa, extending from the Transvaal and Natal to the Cape ; also recorded from the O.F.S., Griqualand West, the Somerset West and Albert districts.

8032

20. HYPOESTES, R.Br.

Bracts 2, free, or united at the base into a tube ; bracteoles 2, sometimes absent in some flowers, longer than the calyx. *Calyx* 5-partite nearly to the base ; segments linear. *Corolla* 2-lipped ; tube slender, dilated near the top ; the upper lip erect, concave, or at length recurved, entire or shortly 2-fid ; the lower lip sometimes 3-fid to the middle. *Stamens* 2, inserted

below the corolla-throat, shorter than the lips, or exserted; anthers 1-theccous, muticous. *Disc* cup-shaped. *Ovary* with 1 ovule (or 2) in each chamber; style shortly and equally 2-fid. *Capsule* oblong, on a solid stalk, 4- or 2-seeded; placentas not rising elastically from the base of the capsule. *Seeds* smooth or rough.

Herbs or shrubs; leaves entire, often wavy on the margins; inflorescence of spikelets arranged in cymes heads or spikes, axillary or terminal.

Species about 60, natives of Africa, Madagascar, east India, China, the Malay Archipelago, and Australia; 6 species in South Africa, extending from the Transvaal and Natal through the coastal belt to the Caledon district; also recorded from the O.F.S., Bechuanaland, and the Somerset East district.

8039

21. MACKAYA, Harv.

Corolla somewhat curved, hardly 2-lipped; tube much inflated in the upper half; lobes 5, not very unequal. *Stamens* 2, fertile; 2 represented by linear filaments without rudiments of an anther; anthers at equal heights, muticous. *Seeds* hardly rugose. All other characters as for *Asystasia*.

Species about 4; 3 species in India; 1 species in South Africa, found in Natal.

8048

22. ECBOLIUM, Kurz

Bracts large, enclosing the calyx; bracteoles small, linear. *Calyx* deeply 5-fid; segments linear, sub-equal. *Corolla* 2-lipped; tube cylindric; upper lip spreading or recurved, 2-toothed; lower lip spreading, 3-lobed, with the middle lobe broad. *Stamens* 2, inserted below the corolla-throat, sub-exserted; anthers 2-theccous, with the thecae at equal heights, muticous. *Disc* annular. *Ovary* with 2 ovules in each chamber; style obtuse, scarcely 2-lobed at the apex. *Capsule* ovate, compressed, contracted into a long stalk, 4-seeded, or 2-seeded by abortion. *Seeds* orbicular, plano-compressed, rugose.

Shrubs; leaves entire; inflorescence a terminal strobilate spike.

Species 8-12, natives of Africa, Madagascar, Arabia, and India; 2 species in South Africa, recorded from Delagca Bay and Komgha.

8049

23. SIPHONOGLOSSA, Oerst.

Bracts and bracteoles linear, short; bracteoles sometimes absent. *Calyx* 4-5-partite; segments narrow. *Corolla* 2-lipped; tube narrowly cylindric, much longer than the limb; upper lip entire or 2-fid; lower lip spreading, 3-fid; palate veiny. *Stamens* 2, attached below the top of the corolla-tube, included, or shorter than the upper lobe; anthers 2-theccous, mucronate or spurred at the base. *Ovary* with 2 ovules in each chamber; style very shortly 2-lobed at the apex. *Capsule* oblong, contracted into a solid stalk at the base. *Seeds* 4, or fewer by abortion, sub-orbicular, plano-compressed, tubercular-rugose.

Low spreading shrubs, pubescent; leaves ovate, entire; flowers axillary, solitary, sub-sessile.

Species about 8, natives of tropical America and Africa; 3 species in South Africa, recorded from the Transvaal, Pondoland, East Griqualand, the Komgha and Alexandria districts.

8054

24. RHINACANTHUS, Nees

Bracts and bracteoles small, linear. *Calyx* small, 5-partite nearly to the base; segments linear. *Corolla* 2-lipped; tube linear, much longer than the lips; upper lip erect or recurved, sub-entire or 2-toothed; lower lip flat-spreading, sub-3-fid. *Stamens* 2, attached in the throat of the corolla,

shorter than the corolla-lips ; anthers 2-theous, one a very little below the other, not tailed, but sometimes mucronate at the base. *Disc* cup-shaped. *Ovary* hairy, with 2 ovules in each chamber ; style obtuse or minutely 2-lobed at the apex. *Capsule* oblong, with a cylindric stalk, 4-seeded at the top ; placentas not rising elastically from the base of the valves. *Seeds* covered with tubercles.

Rambling shrubs ; leaves entire ; inflorescence various.

Species about 6, found in Africa, Madagascar, east India, and the Malay Archipelago ; 1 species in South Africa, recorded from Natal and Pondoland.

8055

25. DUVERNOYA, E.Mey.

(*Adhatoda*, Nees)

Bracts and bracteoles herbaceous, oblong or linear, often much longer than the calyx. *Calyx* divided to the middle, or deeply 5-partite ; lobes lanceolate, with the 2 lower lobes at length cohering. *Corolla* 2-lipped ; tube short ; the upper lip erect, galcate, sub-entire ; the lower lip recurved-spreading, broadly 3-fid ; palate convex. *Stamens* 2, attached below the top of the corolla-tube ; filaments villous, shorter than the upper lip ; anthers 2-theous, sometimes obscurely mucronate at the base, never spurred. *Disc* cup-like. *Ovary* often tomentose, with 2 ovules in each chamber ; style-apex entire, sub-clavate. *Capsule* oblong-clavate, contracted into a long solid stalk at the base. *Seeds* by abortion often 1 or 2, sub-orbicular, plano-compressed, rugose.

Erect shrubs, glabrous, canescent or pubescent ; leaves entire ; inflorescence various.

Species about 8, found in east India, South America, and Africa ; 4 species in South Africa, extending from the Transvaal and Natal to the Transkei.

8063

26. RUTTYA, Harv.

Bracts small, linear ; bracteoles small, linear. *Calyx* 5-partite nearly to the base ; segments equal. *Corolla* 2-lipped ; tube wide ; the upper lip emarginate or very shortly 2-fid ; the lower lip shortly or deeply 3-fid, with the lobes equal. *Stamens* 2, fertile, inserted in the corolla throat, slightly shorter than the upper lip ; anthers 1-theous. *Disc* annular, scarcely conspicuous. *Ovary* with 2 ovules in each chamber ; style obtuse or scarcely very shortly 2-lobed. *Capsule* ellipsoid, stalked, 4-seeded in the upper part. *Seeds* without hairs.

Erect herbs or shrubs ; leaves entire ; the herbaceous petioles disarticulated at the base, leaving small wooden cup-like scars on the branches ; inflorescence a dense terminal panicle, appearing as a short or long cylindric spike.

Species about 5, natives of tropical Africa, Arabia, and Madagascar ; 1 species in South Africa, found in the northern Transvaal and Natal.

8079

27. ISOGLOSSA, Oerst.

Bracts and bracteoles shorter than the calyx. *Calyx* 5-partite nearly to the base ; segments linear. *Corolla* 2-lipped ; tube short or long ; the upper lip erect, concave, entire or 2-fid ; the lower lip not much shorter than the tube, with 3 oblong or ovate lobes. *Stamens* 2, inserted in the throat of the corolla, shorter than the upper lip ; anthers 2-theous, with one theca completely above the other. *Disc* annular or shortly cup-shaped. *Ovary* oblong-ellipsoid, with 2 ovules in each chamber ; style apex entire. *Capsule* oblong, often acuminate, contracted at the base into a long or short solid stalk, 4-seeded, rarely seeds fewer by abortion. *Seeds* plano-compressed, sub-orbicular, rugose.

Herbs or undershrubs, pubescent, villous, or glabrous; leaves ovate or elliptic; inflorescence a panicle, often glandular-viscid.

Species about 20, natives of Africa, Madagascar, and India; 14 species in South Africa, extending from the Transvaal and Natal to the Knysna district.

8692

28. HIMANTOCHILUS, T.Anders.

(*Macrorungia*, C.B. Cl.)

Bracts prominent, imbricate. *Calyx* 5-lobed to about the middle; lobes lanceolate. *Corolla* 2-lipped; tube slender; upper lip concave, 2-toothed; lower lip 3-fid. *Stamens* 2, inserted below the corolla-throat, much exserted; anthers 2-theous, with one theca a little below the other, muticous. *Disc* annular. *Ovary* ovoid or ovoid-oblong, with 2 ovules in each chamber. *Capsule* ovoid or ovoid-oblong; placentas rising elastically from the base of the valves.

Shrubs; leaves entire; inflorescence a strobilate spike.

Species about 6, all African; 1 species in South Africa, recorded from the northern Transvaal.

8094

29. JUSTICIA, Linn.

(*Monechma*, Hochst.)

Bracts large or small; bracteoles generally small, narrow. *Calyx* 4- or 5-partite almost to the base. *Corolla* (in the South African species) 2-lipped, hairy; tube not or scarcely longer than the limb; the upper lip entire or shortly 2-lobed; lower lip 3-lobed; palate often with spots or transverse wrinkles. *Stamens* 2, inserted in the corolla-throat, shorter than the upper lip; anthers 2-theous, with usually one theca below the other, tailed at the base, rarely anther-thecae nearly at equal heights and basal tail absent or minute. *Disc* cup-shaped. *Ovary* with 2 ovules in each chamber; style thinly hairy or glabrous, very shortly branched at the apex. *Capsule* ovate or oblong, thick or compressed, 2-4-seeded. *Seeds* tubercular-rugose or smooth, not rising with the placentas elastically from the base.

Herbs or shrubs; leaves entire or obscurely wavy; inflorescence a strobilate spike, a compound or simple cyme, or the flowers solitary or 2-3-nate in the axils of the bracts.

Species about 200, distributed throughout the warmer parts of the world; 25 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district; also recorded from a few central districts, Griqualand West, and the Clanwilliam district.

171. MYOPORACEÆ.

Flowers bisexual, irregular or nearly regular. *Calyx* 5-partite or 5-lobed. *Corolla* gamosepalous; limb oblique or 2-lipped, 5- (or rarely 6-) lobed; lobes imbricate, with the 2 upper often exterior, sometimes deeply connate. *Stamens* 4, didynamous or sub-equal, rarely as many as the corolla-lobes, inserted on the corolla and alternating with its lobes, included or exserted; anthers normally 2-theous, with the thecae at first parallel, afterwards diverging from the confluent apex. *Disc* hypogynous, small or nearly obsolete. *Ovary* superior, 2-chambered, or more or less perfectly 3-10-chambered by the intrusion of the septa between the ovules; when the ovary is 2-chambered then ovules 2 in each chamber or 4-8 in superposed pairs; when the ovary is many-chambered then ovules solitary in each chamber;

stigma terminal, small, entire or obscurely emarginate, rarely oblique. *Fruit* drupaceous, 2-locular, or the loculi as many as the seeds, rarely breaking up into pyrenes. *Seeds* 2-10, usually solitary in the loculi, arranged in one series round the axis; endosperm fleshy, slender or nearly absent; embryo straight or slightly curved.

Erect or diffuse herbs, shrubs, or rarely trees; leaves simple, alternate or rarely opposite, entire or rarely toothed; stipules 0; flowers axillary, solitary or fascicled, sub-sessile or pedicellate; bracts small, or 0.

Genera 6, with about 80 species, mostly Australian.

8114

1. *OFTIA*, Adans.

Calyx 5-partite. *Corolla* 5-lobed; tube cylindric, equal or slightly dilated at the villous throat; lobes obovate, sub-equal. *Stamens* 4, sub-equal, attached to the middle of the corolla-tube, included. *Ovary* 2-chambered, with 4-6 ovules superposed in pairs in each chamber; stigma oblong, oblique, somewhat thickened. *Drupe* small, globose, succulent. *Seed* often solitary through abortion, oblong, somewhat curved.

Shrubs, much branched, villous or sometimes viscid-pubescent; leaves alternate, or the lower opposite or somewhat verticillate, sessile, serrulate; flowers white, sessile or shortly pedicelled in the upper axils; bracts 0.

Endemic; species 2, found in the coastal districts from Namaqualand to Riversdale.

172. PLANTAGINACEÆ.

Flowers regular, usually bisexual. *Calyx* 4-partite; sepals imbricate, persistent, free or connate, keeled on the back, with membranous margins. *Corolla* hypogynous, scarious, marcescent, 4-lobed; tube ampulliform or cylindric; lobes imbricate in bud. *Stamens* usually 4 (rarely 1-2), inserted on the corolla-tube and alternating with the lobes; anthers versatile, 2-theous. *Ovary* superior, 1-4-chambered, with 1 to many ovules in each chamber. *Fruit* a 1-4-locular circumscissile capsule, sub-membranous, 1- or many-seeded, or a bony nut. *Seeds* attached to the placenta by the inner face; endosperm fleshy; embryo cylindric; radicle inferior.

Perennial or annual herbs, with or without stems; leaves in the stemless plants rosulate; leaves in the caulescent plants alternate or opposite; petioles usually dilated at the base; flowers usually spicate (rarely solitary), each subtended by a persistent bract.

Genera 3, with about 200 species, found chiefly in temperate and sub-temperate regions.

8116

PLANTAGO, Linn.

Flowers bisexual, or some unisexual, each supported by a bract. *Calyx* 4-lobed; segments sub-equal, or the two outer larger. *Corolla* 4-lobed; tube cylindric or ampulliform. *Stamens* 4, inserted on the corolla-tube. *Ovary* usually 2-chambered, with 1 to several ovules in each chamber; style simple. *Capsule* membranous, circumscissilely dehiscent at the middle or near the base. *Seeds* 2 to several.

Annual or perennial herbs, often stemless with the leaves in a radical rosette; leaves various, usually entire; inflorescence a spike or head of inconspicuous flowers.

Species nearly 200, cosmopolitan; 8 species in South Africa, fairly generally distributed.

173. RUBIACEÆ.

Flowers bisexual, rarely unisexual, usually regular. *Calyx* obsolete, cup-like, or tubular, entire, toothed, or lobed, sometimes 1 or more of the lobes produced and foliaceous. *Corolla* gamopetalous, funnel- or salver-shaped, campanulate, or rotate, rarely urceolate or tubular, glabrous or pilose within, naked or hairy in the throat; lobes 4-10, equal, very rarely unequal or 2-lipped, valvate, imbricate, or contorted. *Disc* various. *Stamens* equalling the number of the corolla-lobes and alternating with them, very rarely fewer, inserted on the tube or in the throat of the corolla; filaments short, or elongated, or 0; anthers 2-theous, usually opening by longitudinal slits. *Ovary* inferior or half-inferior, 1-10-chambered, very often 2-chambered, with 1 to many ovules in each chamber; style short or elongated, simple, or styles several, free; stigma simple, various, sometimes divided into lobes. *Fruit* a capsule, drupe, berry, indehiscent, or 2-cocceous. *Seeds* various; embryo small or large, straight or curved; endosperm fleshy, or horny, very rarely 0.

Herbs, shrubs, or trees, sometimes prickly or spiny; leaves simple, opposite or whorled, usually entire, stipulate; stipules various, usually between the petioles, often adnate to the petioles, sometimes resembling the leaves, often united in pairs; inflorescence various.

Genera 395; species over 5,000, found in all parts of the world, especially abundant in tropical countries.

SERIES A.—Ovules indefinite in each ovary-chamber.

- Tribe **Hedyotideæ**: Flowers not in a spherical head; corolla valvate; fruit dry, indehiscent, 2-cocceous, or capsular, 2-4-locular; seeds numerous or few, wingless (genera 1-3).
 Tribe **Nauceeæ**: Flowers in a compact spherical head; corolla narrowly funnel-shaped, sometimes contorted; stigma entire, long exserted; fruit dry, indehiscent, 2-cocceous, or capsular (genera 4-5).
 Tribe **Mussaendeæ**: Corolla valvate; fruit fleshy; seeds numerous, minute, angled (genus 6).
 Tribe **Gardenieæ**: Corolla contorted; fruit fleshy; seeds numerous or few, large and compressed, or smaller and angled (genera 7-12).

SERIES B.—Ovule solitary in each ovary-chamber.

- Tribe **Albortieæ**: Corolla contorted; stamens inserted in the corolla-throat; seeds with endosperm; embryo straight (genera 13-14).
 Tribe **Knoxieæ**: Corolla valvate; stamens inserted in the corolla-throat; seeds compressed, with copious endosperm; embryo straight (genus 15).
 Tribe **Vanguerieæ**: Corolla valvate; stamens inserted in the corolla-throat; seeds with endosperm; embryo straight (genera 16-20).
 Tribe **Ixoreæ**: Corolla contorted; ovary 2-4-chambered; ovule inserted at the middle or below the middle of the ovary-chamber, rarely basal; embryo curved (genus 21).
 Tribe **Psychotrieæ**: Corolla valvate; stamens inserted in the corolla-throat; ovary 2 to many-chambered; stigma entire, or style-branches short; fruit indehiscent; ovule basal, erect; embryo curved (genera 22-23).
 Tribe **Anthospermeæ**: Flowers often unisexual; corolla valvate; stamens inserted at the base of the corolla, rarely in the throat; ovary 1-4-chambered, with an erect basal ovule; style entire, or style-branches filiform; fruit a berry, capsule, or separating into cocci; embryo curved (genera 24-29).
 Tribe **Spermacoceæ**: Herbs or shrubs; corolla valvate; leaves very often opposite; stipules setose; ovule attached to the septum; embryo curved (genera 30-33).
 Tribe **Galieæ**: Herbs; corolla valvate; leaves and leaf-like stipules in whorls; ovule attached to the septum; embryo curved (genera 34-36).

- | | |
|---|---------------------------------|
| 1. Leaves and leaf-like stipules in whorls | 2 |
| Stipules various, but not resembling the leaves | 4 |
| 2. Corolla-lobes and stamens 5 | 36. <i>Rubia</i> , <i>Linn.</i> |
| Corolla-lobes and stamens 4, more rarely 3 | 3 |

3. Leaves somewhat pungent, marginate ; style simple, bifid at the apex **34. Sherardia, Linn.**
Leaves not pungent nor marginate ; styles 2 **35. Galium, Linn.**
4. One or more of the calyx-lobes much produced and coloured, either reddish and 7-8 times as long as the other lobes, or yellow and leaf-like on a long stalk 5
Calyx-lobes not produced, but if so then not coloured 6
5. One calyx-lobe much elongated, yellow **6. Mussaenda, Linn.**
Two or four calyx-lobes (especially in the fruit) enlarged, spatulate and veiny, reddish **14. Alberta, E. Mey.**
6. Styles 2, hairy, or stigmas 2, long-filiform and hairy or papillose 7
Style simple, usually glabrous ; stigmas mostly entire, if divided then not hairy 11
7. Ovary 2-chambered 8
Ovary 4- (rarely 5-) chambered, with only 2 of the chambers fertile **26. Nenax, Gaertn.**
8. Ovules numerous in each chamber **3. Pentas, Benth.**
Ovule solitary in each chamber 9
9. Fruit densely villous **28. Crocylis, E. Mey.**
Fruit glabrous, pubescent, or hirsute 10
10. Flowers in lax panicles **24. Galopina, Thunb.**
Flowers axillary, sessile, solitary **25. Anthospermum, Linn.**
11. Stigma fusiform or cylindric, sometimes divided at the apex, with narrow membranous longitudinal wings 12
Stigma various, if fusiform then not with longitudinal wings 14
12. Corolla-tube many times longer than the calyx **10. Gardenia, Ellis**
Corolla-tube about twice as long as the calyx 13
13. Leaves not distinctly petioled ; flowers solitary **9. Randia, Linn.**
Leaves distinctly petioled ; flowers in panicles or panicle cymes **13. Rhabdostigma, Hook.**
14. Sub-succulent plants of the seashore **31. Hydrophylax, Linn. f.**
Herbaceous or woody plants, not sub-succulent 15
15. Hispid or villous herbs, with muricated fruits **30. Richardsonia, Kunth**
Herbaceous or woody plants, if hispid or villous then fruits not muricated 16
16. Flowers in heads surrounded by paleaceous bracts adnate to the calyx **4. Adina, Salisb.**
Flowers various, if in heads then heads not surrounded by paleaceous bracts 17
17. Flowers in dense globose heads ; anthers 2-cuspidate at the base **5. Cephalanthus, Linn.**
Flowers not in dense globose heads ; anthers entire at the base, very rarely 2-lobed 18
18. Ovules more than 1 in each ovary-chamber 19
Ovule solitary in each ovary-chamber 27
19. Decumbent herbs, found growing in water or damp places **2. Pentodon, Hochst.**
Woody plants, if with herbaceous stems then erect or with woody rootstocks 20
20. Stamens inserted on the corolla-tube 21
Stamens inserted in the corolla-mouth or -throat 22
21. Flowers in heads ; corolla-tube hairy **8. Burchellia, R.Br.**
Flowers solitary, or in cymes, or panicles ; corolla-tube glabrous **1. Oldenlandia, Linn.**
22. Stigma 2-fid or 2-lobed 23
Stigma entire 25
23. Style thick, club-shaped or fusiform above **10. Gardenia, Ellis**
Style slender, not distinctly thickened above 24
24. Corolla-lobes valvate in bud ; fruit a capsule, or separating into 2 indehiscent cocci **1. Oldenlandia, Linn.**
Corolla-lobes contorted in bud ; fruit a berry **12. Tricalysia, A.Rich.**

25. Style much exserted 7. *Tarenna*, Gaertn.
 Style not or slightly exserted 26
26. Anthers exserted, with the connective produced into an acuminate
 appendage 11. *Oxyanthus*, DC.
 Anthers not exserted, nor with an acuminate appendage 9. *Randia*, Linn.
27. Style exserted, filiform and hairy; stigmas 2, thread-shaped 28
 Style exserted or included, simple, bifid, or lobed, but lobes not filiform 30
28. Inflorescence distinctly peduncled; peduncle sometimes long;
 flowers in dense head-like cymes 15. *Pentanisia*, Harv.
 Inflorescence not distinctly peduncled; flowers not in dense head-like cymes 29
29. Stamens inserted at the base of the corolla-tube 27. *Carpacoce*, Sond.
 Stamens inserted in the corolla-throat 29. *Otiophora*, Zucc.
30. Flowers sessile, in small axillary fascicles, or solitary 32. *Borreria*, Mey.
 Flowers pedicelled, in heads, cymes, corymbs, or panicles 31
31. Flowers in heads 32
 Flowers in corymbs or cymes 34
32. Ovary ovoid, sub-globose, or turbinate 33
 Ovary campanulate, truncate 22. *Psychotria*, Linn.
33. Stigma undivided 15. *Pentanisia*, Harv.
 Stigmas 2 33. *Mitracarpus*, Zucc.
34. Fruit a capsule 1. *Oldenlandia*, Linn.
 Fruit a drupe or berry 35
35. Corolla-tube narrow, cylindric, many times longer than the ovary 21. *Pavetta*, Linn.
 Corolla-tube globose, urceolate, campanulate, or funnel-shaped, usually only about twice as long as the ovary 36
36. Flowers in trichotomous cymes (rarely partly dichotomous by abortion); ovules erect 23. *Grumilea*, Gaertn.
 Flowers in simple or dichotomous cymes, fascicled, or in pseudo-panicked spikes; ovules pendulous 37
37. Stigma, when viewed sideways, campanulate in outline, or globose, with 2 or more distinct or indistinct lobes 38
 Stigma, when viewed sideways, oblong, quadrate, or more or less elliptic in outline, entire or bifid at the apex 39
38. Leaves opposite; disc projecting slightly above the calyx; calyx truncate or with minute teeth 18. *Plectronia*, Linn.
 Leaves whorled; disc sunk in the calyx-throat; calyx with 5-10 unequal lobes 17. *Fadogia*, Schweinf.
39. Calyx lobed to the top of the ovary; disc level with the calyx-throat; fruit a large fleshy drupe 16. *Vangueria*, Juss.
 Calyx produced into a short broad tube above the ovary; disc sunk in the calyx-throat; fruit a small fleshy drupe or dry 40
40. Stamens in open flowers strongly reflexed and pressed against the outside of the corolla-tube; stigma bifid at the apex; endosperm white, soft, homogeneous 19. *Mitrastigma*, Harv.
 Stamens in open flowers erect; stigma scarcely divided above, with 3 ridges on either side; endosperm bony, heterogeneous 20. *Keetia*, Phill.

8136

1. OLDENLANDIA, Linn.

(Hedyotis, Linn.)

Calyx-lobes or -teeth 4, rarely 5, very often short, acute, persistent, very rarely alternating with small teeth. *Corolla* funnel-shaped, campanulate, or salver-shaped; tube short or long, glabrous, pilose, or bearded in the throat; lobes 4, rarely 5, ovate, rarely linear, obtuse, valvate. *Disc* sometimes fleshy, small. *Stamens* 4, rarely 5, inserted on the tube or in the throat of the corolla, included or exserted. *Ovary* ovoid, globose, or turbinate, 2-chambered, with many (rarely few or 1) ovules in each chamber; style

slender; stigma 2-fid or 2-lobed. *Fruit* a small capsule, or separating into 2 indehiscent cocci. *Seeds* numerous or few, angled or plano-convex; embryo terete; endosperm fleshy or horny.

Herbs, shrubs, or undershrubs; leaves opposite, very rarely 3-nate, lanceolate or linear, often small; stipules acute or acuminate, often setose; flowers in lax or dense terminal or axillary cymes, or in dichotomous panicles, very rarely solitary.

Species about 260, found in almost all tropical countries; 39 species in South Africa, with a fairly general distribution.

8145

2. PENTODON, Hochst.

Calyx-lobes 5, lanceolate-subulate, persistent. *Corolla* shortly and broadly funnel-shaped, pilose or villous in the throat; lobes 5, short, obtuse, valvate. *Disc* inconspicuous. *Stamens* 5, inserted in the corolla-throat, included; filaments short. *Ovary* turbinate or obconic, 2-chambered, with numerous ovules in each chamber; style short; stigmas 2. *Fruit* a small capsule, several-seeded. *Seeds* minute, angled; embryo club-shaped; endosperm fleshy.

Decumbent herbs, sometimes aquatic or found in damp places; leaves opposite, sessile or shortly petioled; stipules connate with the petioles, entire or 2-3-toothed; flowers small, in axillary and terminal long-peduncled cymes which are sometimes dichotomous or laxly and irregularly racemose.

Species 2, found in Africa, the Seychelles Islands, and South America; 1 species found in Natal.

8154

3. PENTAS, Benth.

Calyx-lobes 4-6, unequal, sometimes enlarged, especially in the fruit, sometimes alternating with 1-2 teeth or glands. *Corolla* funnel-shaped; tube elongated, pilose, villous in the throat; lobes 4-6, spreading, ovate-oblong, valvate. *Disc* tumid or annular, sometimes produced into a short cone after flowering. *Stamens* 4-6, inserted below the corolla-throat. *Ovary* obconic or shortly turbinate, 2-chambered, with numerous ovules in each chamber; styles 2, filiform or linear, hairy. *Fruit* a capsule. *Seeds* minute, angled; embryo club-shaped; endosperm fleshy.

Herbs or undershrubs, hispid-pilose or tomentose; leaves opposite, petioled, ovate or ovate-lanceolate; stipules multifid or multisetose; flowers in short or long corymbose cymes, sometimes sub-capitate.

Species about 45, natives of Africa and Madagascar; 2 species in South Africa, recorded from the northern Transvaal and Natal.

8226

4. ADINA, Salisb.

Calyx-lobes 5, short or elongated, persistent or deciduous. *Corolla-tube* elongated, with a funnel-shaped throat, glabrous within; lobes 5, ovate or rounded, valvate. *Disc* cupular. *Stamens* 5, inserted in the corolla-throat, exserted. *Ovary* prismatic, 2-chambered, with many ovules in each chamber; style filiform; stigmas long exserted, capitate or club-shaped. *Fruit* separating into 2 cocci which are crowned with the persistent calyx-lobes. *Seeds* oblong, winged; cotyledons flat; endosperm copious.

Trees or shrubs; leaves opposite, petioled, ovate, lanceolate, or cordate; stipules large, oblong, obtuse, caducous; flowers in solitary or panicle peduncled globose compact heads, with the peduncle often articulated below the apex; heads surrounded by paleaceous bracts cohering with the calyx; receptacle pilose.

Species about 18, found in Africa and tropical Asia; 1 species occurs in the northern Transvaal and Zululand.

8230

5. CEPHALANTHUS, Linn.

Calyx-lobes or *-teeth* 4-5, unequal. *Corolla* more or less funnel-shaped, glabrous or pilose in the throat; lobes 4, imbricate. *Disc* inconspicuous. *Stamens* 4, inserted in the corolla-throat; filaments short; anthers 2-cuspidate at the base. *Ovary* obpyramidal, 2-chambered, with a solitary pendulous ovule in each chamber; style filiform; stigma capitate or somewhat club-shaped. *Fruit* obpyramidal, of 2-4 indehiscent cocci; cocci 1-seeded, or one or other without seeds. *Seeds* oblong, with a spongy arillus, sometimes shortly winged; cotyledons flat; endosperm sub-cartilagenous.

Shrubs or small trees; leaves opposite or in whorls of 3-4, shortly petioled, oblong or ovate-lanceolate; stipules short; flowers in dense globose heads, intermixed with setaceous bracts or paleae; heads terminal and axillary, solitary or paniced, sometimes whorled on the branches.

Species about 12, natives of America, Asia, and Africa; 1 species occurs in the northern Transvaal and Natal.

8238

6. MUSSAENDA, Linn.

Calyx-lobes 5, short or elongated, deciduous, rarely persistent, one often strongly produced and white or coloured. *Corolla* funnel-shaped, often silky, villous in the throat; lobes 5, small, reduplicate-valvate, often twisted at the apex. *Disc* annular or cushion-shaped. *Stamens* 5, inserted in the corolla-throat; filaments very short; anthers narrow-linear. *Ovary* oblong or turbinate, 2-chambered, with numerous ovules on a fleshy placenta; style filiform; stigmas 2, linear. *Fruit* fleshy and indehiscent, rarely dry and dehiscent, with a depression at the apex, or crowned with the persistent calyx. *Seeds* minute, deeply pitted; embryo minute; endosperm fleshy.

Shrubs or undershrubs, rarely herbs; leaves opposite or in whorls of 3, sub-sessile or petioled; stipules sometimes solitary, free or connate; flowers in many-flowered terminal corymbs; bracts and bracteoles deciduous.

Species about 120, distributed in the warmer parts of Africa, Asia, and the Pacific Islands; 1 species found in Zululand, probably cultivated.

8278

7. TARENNA, Gaertn.

Calyx-lobes 5, deciduous, rarely persistent, or lobes 0. *Corolla* funnel- or salver-shaped; tube short or long, glabrous or villous in the throat; lobes 5, longer or shorter than the tube, contorted. *Disc* annular. *Stamens* 5, inserted in the corolla-mouth; filaments short, or 0; anthers narrow-linear. *Ovary* obovoid or turbinate, 2-chambered, with 2-3 to many ovules in each chamber, rarely with a single ovule; style filiform, sometimes pilose, thickened at the apex, much exserted. *Fruit* a berry or drupe, 1 to few-seeded. *Seeds* sub-globose; embryo small; endosperm fleshy or horny.

Trees or shrubs; leaves opposite, petioled, lanceolate, or oblong or ovate-lanceolate; stipules ovate, free, or connate at the base, sometimes deciduous; flowers in many- or few-flowered terminal corymbs or corymbose cymes; bracts and bracteoles small, very often absent.

Species about 50, natives of Asia and Africa; 1 species in South Africa, recorded from Natal and doubtfully from the northern Transvaal.

8281

8. BURCHELLIA, R.Br.

Calyx-lobes 5, sub-equal, lanceolate-subulate, leathery, persistent. *Corolla* tubular-campanulate, with a ring of hairs at the base within, silky-pubescent without, with the throat glabrous; lobes 5, short, oblique, acute, contorted.

Disc annular. *Stamens* 5, inserted at the middle of the corolla-tube; filaments very short; anthers linear-oblong. *Ovary* obovoid, 2-chambered, with numerous ovules in each chamber; style short, pilose; stigma oblong-clavate. *Fruit* a berry, 2-locular, many-seeded. *Seeds* compressed, angled; embryo axile; endosperm densely fleshy.

Shrub or small tree; leaves opposite, shortly petioled, obovate-oblong, obtuse, leathery; stipules leathery, cuspidate, deciduous; flowers red, in many-flowered terminal heads.

Endemic; species 1, extending from Swellendam to Natal and the Transvaal.

8283

9. RANDIA, Linn.

(*Stylocoryna*, Cav.; *Mitriostigma*, Hochst.)

Calyx-lobes linear-subulate, elongated, or obovate and leafy, persistent or deciduous, sometimes 0. *Corolla* funnel-shaped, campanulate or salver-shaped; tube short or elongated, glabrous or villous in the throat; lobes 5, rarely more, acute or obtuse, contorted. *Disc* annular or cushion-shaped. *Stamens* 5, inserted in the mouth or throat of the corolla; filaments very short, or 0; anthers narrow-linear. *Ovary* ovoid, obovoid, or turbinate, smooth or ribbed, 2-chambered, with few or many ovules in each chamber; style glabrous or pilose; stigma club-shaped or fusiform. *Fruit* a globose or ellipsoid berry, 2-locular, few- or many-seeded. *Seeds* compressed or angled; embryo small; endosperm dense or thin.

Trees or shrubs, sometimes spiny: leaves opposite, obovate-oblong, lanceolate, or elliptic-lanceolate; stipules short, sometimes cuspidate, almost connate at the base or adnate to the petiole; flowers axillary or terminal, solitary, fascicled in corymbs or in few-flowered cymes.

Species about 250, found in almost all tropical regions, especially Asia and Africa; 9 species in South Africa, extending from the Transvaal and Natal, through the coastal belt to Swellendam.

8285

10. GARDENIA, Ellis

Calyx-lobes or -teeth 5. *Corolla* tubular or sub-campanulate, long exceeding the ovary; lobes 5-9, short or elongated, contorted. *Disc* various, often annular or conical. *Stamens* 5-9, inserted in the corolla-throat; filaments very short, or 0; anthers linear-oblong. *Ovary* ovoid or obconic, often ribbed, 1-chambered, incompletely divided by 2-5 septa, with numerous ovules on 2 parietal placentas; style thick, club-shaped or fusiform at the apex; stigma bifid. *Fruit* a fleshy oblong ovoid cylindric or pear-shaped berry, sometimes ribbed, crowned with the persistent calyx. *Seeds* minute, immersed in the fleshy parietal placentas; cotyledons broadly foliaceous; endosperm horny.

Shrubs, rarely trees, armed or unarmed: leaves small or large, opposite, rarely in whorls of 3; stipules triangular, acute, sometimes acuminate, often connate at the base; flowers axillary and solitary, very rarely terminal in corymbs.

Species about 135, found in almost all tropical countries; 10 species in South Africa, extending from the Transvaal and Natal to Swellendam.

8293

11. OXYANTHUS, DC.

Calyx-teeth 5, small. *Corolla* salver-shaped, elongated, glabrous in the throat; lobes 5, narrowly lanceolate, acuminate, contorted. *Disc* annular. *Stamens* 5, inserted in the mouth of the corolla; filaments short or very short; anthers linear-oblong or narrow-linear, exserted, with the connective

acuminate above, often 2-lobed at the base. *Ovary* small, obovoid, constricted above or sub-cylindric, 1-2-chambered, with numerous ovules in each chamber on 2 parietal placentas; style slender; stigma narrowly fusiform or clavate. *Fruit* an ovoid or sub-ellipsoid berry, 1-locular, many-seeded. *Seeds* large, obtusely angled; cotyledons ovate, foliaceous; endosperm fleshy.

Trees or shrubs; leaves opposite, shortly petioled, often oblique at the base; stipules large, oblong, obtuse or acute, deciduous; flowers in axillary short or elongated many-flowered corymbs; bracts present.

An African genus of 37 species; 4 species in South Africa, extending from the northern Transvaal, through Swaziland and Natal to Pondoland and Kentani.

8308

12. *TRICALYSIA*, A.Rich.

(Kraussia, Harv.; Bunburya, Meissn.)

Calyx-lobes or *-teeth* 5; calyx sometimes sub-spathaceous and 2-parted. *Corolla* funnel-shaped or salver-shaped, glabrous or villous in the throat; lobes 4-8, oblong or lanceolate, contorted. *Disc* annular, tumid, or cup-shaped. *Stamens* 4-8, inserted in the mouth or throat of the corolla; filaments subulate or somewhat thickened, short or long; anthers linear or linear-oblong. *Ovary* turbinate, ovoid or obconic, 2-chambered, rarely 3-chambered, with 2-5 or many ovules in each chamber, sometimes silky; style filiform, glabrous or hairy; stigmas 2, oblong or linear. *Fruit* a berry, 1-3-, or few-, or many-seeded. *Seeds* angled or compressed; embryo large or small; endosperm horny or fleshy.

Trees or shrubs, sometimes scandent; leaves opposite, petioled, oblong, elliptic, ovate, obovate, or lanceolate; stipules connate; flowers in many- or few-flowered axillary cymes, sometimes in fascicles; bracts and bracteoles usually present.

Species about 80, natives of Asia and Africa; 8 species in South Africa, extending from the Transvaal and Natal to Komgha.

8336

13. *RHABDOSTIGMA*, Hook. f.

Calyx-tube short, produced above the ovary; teeth 5. *Corolla* rotate or shortly campanulate; tube very short, villous in the throat; lobes 5, lanceolate, acuminate, contorted. *Disc* small, annular. *Stamens* 5, inserted in the mouth of the corolla; filaments short, subulate; anthers elongated-linear, acuminate, exserted. *Ovary* obconic, 2-chambered, with a single pendulous ovule in each chamber; style columnar; stigma elongated, fusiform, 10-ribbed, with the ribs narrowly membranous-winged. *Fruit* a small globose berry.

Small trees or shrubs; leaves opposite, petioled, elliptic; stipules broadly triangular, acute, persistent; flowers in panicles or panicle cymes; bracts and bracteoles present.

An African genus of 3 species; 1 species found in the northern Transvaal and Zululand.

8343

14. *ALBERTA*, E.Mey.

Calyx-lobes 5, very unequal, 2-4 enlarged, at length spathulate and veiny, persistent, often coloured in the fruit. *Corolla-tube* elongated, incurved, villous near the base, naked in the throat; lobes short, erect, acute, contorted. *Disc* tumid. *Stamens* 5, inserted in the corolla-tube; filaments very short; anthers linear, long-acuminate, dorsally pilose. *Ovary* turbinate or obconic, 10-ribbed, 2-chambered, with a single pendulous ovule in each chamber; style filiform; stigma long, acuminate, very shortly bifid.

Fruit small, dry, 2-locular, 10-furrowed, crowned with the 2-4 elongated calyx-lobes. *Seed* cylindric; embryo terete; endosperm fleshy.

Trees or shrubs; leaves opposite, sub-sessile or petioled, oblong, obtuse; stipules aristate, cup-like, broad, deciduous; flowers in terminal panicles.

Species 5, natives of Africa and Madagascar; 1 species occurs in Natal and Pondoland.

8348

15. PENTANISIA, HARV.

Calyx-lobes 3-5, with 1-3 elongated and foliaceous, and with the others small subulate or 0, persistent. *Corolla-tube* elongated, campanulate above, densely villous in the throat; lobes 4-5, ovate, valvate. *Disc* annular. *Stamens* 4-5, inserted in the corolla-throat; filaments short or almost 0; anthers linear-oblong. *Ovary* ovoid or sub-globose, 2-chambered, with a solitary pendulous ovule in each chamber; style filiform, elongated, exserted; stigma simple or minutely capitate, or stigmas 2 and filiform. *Fruit* obovoid, of 2 plano-convex cocci. *Seeds* sub-orbicular or sub-3-angled.

Perennial herbs, glabrous or villous; leaves opposite, sessile or shortly petioled, ovate or linear; stipules 3-5-fid or -setose, adnate to the petiole, persistent; flowers dimorphic, in terminal head-like cymes, afterwards in an elongated spike.

An African genus of 15 species; 2 species in South Africa, found in the Transvaal, Natal, Basutoland, the eastern O.F.S. and extend through the Transkei to the Amatola Mountains and the Bathurst district.

8351

16. VANGUERIA, Juss.

(Pachystigma, Hochst.)

Calyx lobed to the top of the ovary; lobes oblong-linear or linear-oblong, more rarely ovate, varying from half the length of the calyx-tube to longer than the corolla-tube. *Corolla-tube* broadly campanulate, more rarely tubular-campanulate, with a band of deflexed hairs within and sometimes with erect hairs in the throat; lobes reflexed or erect, as long as or slightly longer than the tube, with a small or long apiculus from the back of the apex. *Disc* tumid, level with the calyx-throat. *Stamens* inserted in the corolla-throat; anthers as long as or longer than the filaments. *Ovary* 3-5-chambered, more rarely 2-chambered, with a single pendulous ovule in each chamber; style exserted, gradually thickened below; stigma quadrate in outline, faintly lobed above, truncate at the base. *Fruit* a fleshy drupe, containing 2-5 bony 1-seeded nuts, crowned with the persistent calyx-lobes, or marked with an areola at the summit; embryo straight, surrounded by a soft white homogeneous endosperm.

Small or tall shrubs, sometimes dwarf from an underground rootstock; leaves opposite, rarely in whorls of 3, sessile or shortly petioled, entire; stipules broadly ovate, acuminate; flowers in axillary cymes, sometimes with the flowers on the lateral branches of the cyme in racemes; buds usually acuminate, lobed at the apex.

Species about 90, natives of Africa and tropical Asia; about 24 species in South Africa, extending from the Transvaal and Natal, through the eastern districts to the Kei.

8351a

17. FADOGIA, Schweinf.

Calyx sometimes truncate, produced into a short campanulate tube above the ovary, or lobed down to the ovary; lobes 5-10, unequal. *Corolla-tube* broader than long, with or without a band of reflexed hairs within; lobes 5-6, ovate, with an apiculus from the back of the apex, longer than the tube. *Disc* usually sunk in the calyx-throat. *Stamens* inserted in the corolla-throat; anthers longer than the filaments. *Ovary* 3-6-chambered, with a

single pendulous ovule in each chamber; style exerted, gradually thickened below; stigma campanulate in outline, distinctly 3-6-lobed, truncate at the base, furrowed. *Fruit* a small fleshy drupe, containing 3-6 bony 1-seeded nuts, sometimes nuts fewer by abortion, crowned with the persistent calyx; embryo straight, surrounded by a soft white homogeneous endosperm.

Shrubs, from an underground rootstock; leaves sessile, in whorls of 3-4, more rarely opposite and whorled on the same plant, entire; stipules ovate, acuminate; flowers in short axillary cymes; buds acuminate, lobed at the apex.

An African genus of which only 1 species is represented in the Transvaal.

8352

18. PLECTRONIA, Linn.

(Canthium, Lam.)

Calyx almost truncate; teeth small, shorter than the tube, or almost obsolete. *Corolla-tube* almost as broad as long or broader than long, with, rarely without, a band of inflexed hairs within; lobes ovate, with or without a small apiculus from the back of the apex, as long as or shorter than the tube. *Disc* swollen, projecting slightly beyond the calyx. *Stamens* inserted in the corolla-throat; anthers slightly longer than the filaments. *Ovary* 2-chambered, very rarely 3-chambered, with a single pendulous ovule in each chamber; style exerted, gradually thickened below; stigma campanulate in outline, 2-lobed, or globose and furrowed. *Fruit* a dry drupe, sub-didymous, sometimes 1-locular by abortion, without a fleshy exocarp; embryo straight, surrounded by a soft white homogeneous endosperm.

Shrubs; leaves opposite, entire; stipules ovate, acuminate; flowers in axillary cymes; buds obtuse.

An African genus of about 120 species; about 10 species in South Africa, extending from the Transvaal and Natal, through the coastal districts to the Cape.

8352a

19. MITRASTIGMA, Harv.

Calyx almost truncate, produced into a short wide tube above or to the level of the disc; teeth usually 4, more rarely 5, small. *Corolla-tube* campanulate, with a band of deflexed hairs within; lobes 4, more rarely 5, reflexed, oblong, without an apiculus at the back of the apex, as long as or longer than the tube. *Disc* sunk in the throat of the calyx-tube. *Stamens* inserted in the corolla-throat, at length strongly reflexed and pressed against the outer surface of the corolla-tube; anthers longer than the filaments. *Ovary* 2-chambered; style not or scarcely broadened at the base; stigma oblong in outline, cleft above. *Fruit* a small globose drupe, with a fleshy exocarp, containing 2 bony nuts; embryo straight, surrounded by a soft white homogeneous endosperm.

Shrubs: leaves opposite, shortly petioled, entire; stipules ovate, acuminate; flowers in axillary cymes; buds obtuse.

Endemic; species 3, found in the Transvaal and Natal.

8352b

20. KEETIA, Phillips

Calyx produced slightly above the disc into a widened tube; teeth 5, small, very much shorter than the tube. *Corolla-tube* campanulate, with a band of deflexed hairs within; lobes 5, ovate, reflexed, without an apiculus, longer than the tube. *Disc* sunk in the calyx-throat. *Stamens* inserted in the corolla-throat; anthers longer than the filaments, erect in open flowers. *Ovary* 2-chambered, with a single pendulous ovule in each chamber; style long exerted, scarcely thickened below; stigma elliptic in outline, with 3

distinct ridges on the sides, scarcely divided above, more or less truncate at the base. *Fruit* a dry drupe, sub-didymous, sometimes 1-locular by abortion, without a fleshy exocarp ; embryo straight, surrounded by a brown hard heterogeneous endosperm.

Shrubs : leaves opposite, shortly petioled, entire ; stipules ovate, long-acuminate ; flowers in axillary cymes.

Endemic ; species 1, found in the Transvaal and Natal. (Type species *K. transvaalensis*, Phill.)

8383

21. PAVETTA, Linn.

Calyx-lobes 4, rarely 5, short or elongated, deciduous or persistent. *Corolla* salver-shaped ; tube cylindric, nude or bearded in the throat ; lobes 4, rarely 5, often longer than the tube, contorted. *Disc* tumid, fleshy. *Stamens* 4, rarely 5, inserted in the mouth or throat of the corolla ; filaments sometimes absent ; anthers oblong or subulate. *Ovary* ovoid or turbinate, 2-chambered, with a solitary axile ovule in each chamber ; style slender, often long exserted ; stigma fusiform or somewhat club-shaped. *Fruit* a berry, consisting of 2 pyrenes ; seed with a membranous testa ; embryo incurved ; endosperm horny.

Shrubs or small trees ; leaves opposite, petioled ; stipules often connate, deciduous ; flowers in axillary or terminal trichotomous corymbs, rarely in heads, often very numerous ; bracts present.

Species about 167, found in almost all tropical countries ; 16 species in South Africa, extending from the Transvaal, Zululand and Natal, through the eastern districts to Port Elizabeth.

8399

22. PSYCHOTRIA, Linn.

Calyx truncate, lobed, or toothed. *Corolla* funnel- or salver-shaped ; tube cylindric, straight or curved, usually bearded in the throat ; lobes ovate or lanceolate, valvate. *Disc* cushion-shaped or raised. *Stamens* equalling the number of the corolla-lobes, inserted in the corolla-throat ; filaments short or nearly as long as the anthers ; anthers linear or oblong. *Ovary* shortly campanulate, 2-chambered, with a solitary erect ovule in each chamber ; style filiform, glabrous or somewhat hairy ; stigma bifid, 2-toothed, or nearly entire. *Fruit* sub-globose or ovoid, of 2 pyrenes, sometimes only 1 by abortion. *Seeds* ribbed or furrowed ; embryo small ; endosperm uniform.

Shrubs or small trees ; leaves opposite or whorled ; stipules entire, toothed or cleft ; flowers in terminal, rarely axillary, panicles or heads.

Species over 500, found in most tropical countries, frequent in America ; 2 species recorded from Natal.

8402

23. GRUMILEA, Gaertn.

Calyx shortly toothed, persistent. *Corolla* shortly tubular, hairy in the throat ; lobes 5, ovate, reflexed, valvate. *Disc* raised. *Stamens* 5, inserted in the corolla-throat ; filaments shorter than the anthers ; anthers linear. *Ovary* campanulate, 2-chambered, with a solitary erect ovule in each chamber ; style shortly exserted ; stigma bifid. *Fruit* a ribbed berry, crowned with the persistent calyx. *Seed* solitary ; embryo somewhat curved ; endosperm deeply ruminated.

Shrubs ; leaves opposite ; stipules oblong or ovate ; flowers in congested or panicked terminal cymes (in the South African species in trichotomous cymes).

Species about 50, found in most tropical countries, especially of the Old World ; 1 species recorded from the Transvaal.

8435

24. GALOPINA, Thunb.

Plants dioecious, or flowers sometimes bisexual and unisexual. *Calyx* scarcely toothed, persistent. *Corolla* funnel-shaped or rotate; tube short, glabrous in the throat; lobes 4-5, oblong-lanceolate, revolute, valvate. *Disc* minute. *Stamens* 4-5, inserted on the corolla-tube; filaments filiform; anthers oblong, exserted. *Ovary* obovate or didymous, 2-chambered, with a solitary erect ovule in each chamber; styles 2, filiform, hairy, exserted. *Fruit* obovate-didymous, at length separating into 2 mericarps which are warted on the back. *Seeds* erect; embryo straight; endosperm fleshy.

Erect perennial herbs; leaves opposite, ovate or ovate-lanceolate; stipules tri-cuspidate, adnate to the petiole; flowers minute, in terminal lax panicles.

Endemic; species 2, extending from the Transvaal and Natal, through the eastern districts to Humansdorp.

8438

25. ANTHOSPERMUM, Linn.

Plants dioecious, rarely flowers bisexual and unisexual. *Calyx* 4-5-toothed, with 1 or 2 of the teeth sometimes foliaceous. *Corolla* in male flowers funnel-shaped or rotate, glabrous or pilose in the throat; lobes 3-5, revolute, valvate; corolla in female flowers often very minute, with 2-4 erect lobes. *Disc* minute. *Stamens* 3-5, inserted in the lower part of corolla-tube, filaments hair-like; anthers often large, oblong or linear, exserted. *Ovary* ovoid or obovoid, 2-chambered, with a solitary erect ovule in each chamber; styles 2, mostly very short, rarely connate; stigmas 2, very long, hairy. *Fruit* of 2 easily separable indehiscent 1-seeded mericarps, glabrous, pubescent, or hirsute, not crowned with the persistent calyx. *Seeds* erect; embryo somewhat large; endosperm sub-fleshy.

Small herbs or shrubs; leaves opposite or in whorls of 3, linear or lanceolate, rarely ovate or oblong; stipules adnate to the petioles, with 1-3 cusps; flowers minute, axillary, sessile.

Species 35, confined to Africa and Madagascar; 21 species in South Africa, fairly generally distributed.

8439

26. NENAX, Gaertn.

(Ambraria, Cruse)

Plants dioecious. *Calyx*, in both male and female, 4-5-toothed. *Corolla* in male flowers rotate or shortly funnel-shaped, glabrous in the throat; lobes 4-5, ovate, revolute, valvate; in the female flowers limb small and lobes erect. *Disc* small. *Stamens* 4-5, inserted on the corolla-tube; filaments filiform; anthers oblong, exserted. *Ovary* obovoid, 4-(rarely 5-) chambered, with only 2 of the chambers fertile, with a solitary erect ovule in each; style-branches 2, filiform, hirsute, long-exserted. *Fruit* turbinate or ovoid, 3- (rarely 4-5-) locular, with only 2 loculi containing a solitary seed, each dehiscing into 2 lobes so that the seeds escape, pubescent or sometimes villous, crowned with the persistent calyx. *Seeds* erect; embryo somewhat large; endosperm sub-cartilaginous.

Herbs or undershrubs of the aspect of species of *Anthospermum*; leaves small, usually whorled, rarely opposite, often ericoid; stipules tooth-like, adnate to the petiole; flowers minute, axillary, sessile or shortly pedicelled, rarely panicle.

Endemic; species 6, found from the Cape northwards to S.W. Africa and the north-western districts; also recorded from Knysna, Albany, East London, and Pondoland; also found in the central districts and the western O.F.S.

8443

27. CARPACOCE, Sond.

Flowers bisexual and male on the same plant. *Calyx-lobes* 5, elongated-subulate, sub-equal or strongly unequal, persistent. *Corolla* funnel-shaped; tube short, glabrous in the throat; lobes 5, oblong or linear-lanceolate, horned on the back below the apex, revolute, valvate. *Disc* minute. *Stamens* 5, inserted at the base of the corolla-tube; filaments hair-like; anthers large, linear-oblong, exserted. *Ovary* turbinate, 2-chambered, with a solitary erect ovule in each chamber; style simple, filiform, exserted, hairy. *Fruit* club-shaped, crowned with the persistent calyx, separable when ripe. *Seeds* erect; endosperm sub-cartilaginous.

Perennial herbs or undershrubs; leaves opposite, linear or lanceolate, with revolute margins; stipules toothed or aristate, adnate to the petioles; flowers minute, axillary, solitary, sub-sessile or pedicelled; bracts present.

Endemic; species 3, extending from Clanwilliam to Uitenhage and Albany.

8449

28. CROCYLLIS, E.Mey.

Flowers unisexual by abortion. *Calyx-lobes* 5, ovate-lanceolate, persistent. *Corolla* rotate, nude in the throat; lobes 5, scabrid, recurved, valvate. *Disc* inconspicuous. *Stamens* 5, inserted in the corolla-throat (imperfect in the female flowers); filaments somewhat short; anthers large, oblong, exserted. *Ovary* turbinate, densely setose-woolly, 2-chambered, with a solitary erect ovule in each chamber; style short; stigmas 2, long exserted, papillose. *Fruit* hirsute.

A branched shrub; leaves small, opposite, or fascicled on abbreviated shoots, linear, fleshy, rough, with revolute margins; stipules 2-3-toothed, adnate to the petioles; flowers in sub-heads, panicled at the ends of the branches; peduncle and pedicels short, leafy.

Endemic; 1 species in Namaqualand and S.W. Africa.

8450

29. OTIOPHORA, Zucc.

Calyx 5-toothed, with 1 or 2 of the teeth foliaceous, the others small and minute, persistent. *Corolla* salver-shaped; tube slender, glabrous in the throat; lobes 4-5, linear-oblong or lanceolate, valvate. *Disc* obsolete. *Stamens* 4-5, inserted in the corolla-throat; filaments filiform; anthers oblong, exserted. *Ovary* obovoid, 2-chambered, with a single erect ovule in each chamber; style filiform; stigmas 2, hair-like, glabrous, exserted. *Fruit* a capsule, crowned with the enlarged calyx-lobes, separating into 2 indehiscent cocci. *Seeds* convex on the back; embryo axile; endosperm densely fleshy.

Herbs or undershrubs, erect or prostrate; leaves opposite, ovate or linear-lanceolate; stipules setose-ciliate, adnate to the petioles; flowers minute, axillary, or in lax terminal slender spikes; bracts 0.

An African genus of 9 species; 1 species occurs in the northern Transvaal.

8464

30. RICHARDSONIA, Kunth

Calyx-lobes 4-8, lanceolate or subulate, persistent. *Corolla* funnel-shaped, glabrous in the throat; lobes 3-5, ovate or lanceolate, valvate. *Disc* inconspicuous. *Stamens* 3-5, inserted in the corolla-throat; filaments filiform; anthers linear or oblong, exserted. *Ovary* turbinate or sub-globose, 3-4-chambered, with a solitary ovule in each chamber; style filiform; stigmas 3-4, linear or spatulate, exserted. *Fruit* a capsule, crowned with the persistent calyx, separating into cocci, muricate or papillose, rarely smooth. *Seeds* elliptic-oblong, convex on the back; embryo axile; endosperm horny.

Erect or prostrate hispid or villous herbs ; leaves opposite, sessile or shortly petioled, ovate ; stipules multisetose, adnate to the petioles ; flowers usually small, in dense terminal heads surrounded by an involucre of leaves.

An American genus of 8 or 9 species, one of which has become naturalised in South Africa.

8467

31. *HYDROPHYLAX*, Linn. f.

Calyx with 4 acute erect teeth. *Corolla* sub-fleshy, campanulate-funnel-shaped, with an annular ring of hairs within the tube ; lobes 4, ovate, valvate. *Disc* fleshy. *Stamens* 4, inserted in the corolla-throat ; filaments filiform ; anthers linear, exserted. *Ovary* oblong-obovoid, 4-angled, 2-chambered, with a solitary ovule in each chamber ; style filiform, pubescent ; stigma obscurely 2-lobed. *Fruit* a large sub-corky berry, angular, lanceolate or ovate-oblong, crowned with the persistent calyx. *Seeds* linear-oblong, convex on the back, deeply furrowed on the face ; embryo straight ; endosperm cartilaginous.

Sub-succulent creeping herbs ; leaves opposite, sessile, ovate or oblong ; stipules entire or toothed, adnate to the petioles ; flowers somewhat large, axillary, sessile or sub-sessile, solitary or in pairs.

Species 3, all sea-shore plants, found in India, Africa, and Madagascar ; 1 species in South Africa, found on the sea-shore from the Zitzikama to Zululand.

8473

32. *BORRERIA*, Mey.

(*Spermacoce*, Dill. partly.)

Calyx-lobes 2-4, rarely 5, sometimes alternating with small teeth, persistent. *Corolla* funnel- or salver-shaped ; lobes 4, spreading, valvate. *Disc* obsolete or cushion-shaped. *Stamens* 4, inserted near the mouth or base of the corolla-tube. *Ovary* obovoid or turbinate, 2-chambered, with a single ovule in each chamber ; style terete ; stigma simple or bifid. *Fruit* a 2-locular capsule, crowned with the persistent calyx ; both valves opening and splitting at the apex.

Annual or perennial herbs or undershrubs ; leaves opposite ; stipules setose, adnate to the petioles ; flowers small, in axillary clusters.

Species about 100, found in most tropical countries, especially America, Asia, Africa, and Australia ; 2 species in South Africa, extending from the Transvaal and Natal to Albany.

8479

33. *MITRACARPUS*, Zucc.

(*Mitracarpum*, Zucc.)

Calyx-teeth 4-5, with 2 often longer than the others. *Corolla* salver-shaped or funnel-shaped, often with a ring of hairs within the tube, naked or villous in the throat ; lobes 4, spreading, valvate. *Disc* fleshy. *Stamens* 4, inserted in the corolla-throat ; anthers oblong or linear, included or exserted. *Ovary* turbinate, obovoid, or sub-globose, 2- (very rarely 3-) chambered, with a single ovule in each chamber ; style short or elongated ; stigmas 2, short, linear. *Fruit* a didymous capsule, opening by a lid. *Seeds* oblong or globose ; embryo axile ; endosperm densely fleshy.

Erect or prostrate herbs or sub-shrubs ; leaves opposite, linear, lanceolate, or ovate, with the upper often longer ; stipules multisetose, adnate to the petiole ; flowers small, in dense axillary and terminal heads, often surrounded by 4 leaves.

Species about 42, natives of South America, Africa, and the Pacific Islands ; 1 species in Natal.

8482

34. SHERARDIA, Linn.

Calyx-lobes 4-6, lanceolate, persistent. *Corolla* funnel-shaped, glabrous in the throat; lobes 4, ovate, spreading, valvate. *Disc* minute, tumid. *Stamens* 4, inserted on the corolla-tube; filaments hair-like; anthers linear-oblong, exserted. *Ovary* ovoid, 2-chambered, with a single ovule in each chamber; style bifid at the apex; stigmas capitate. *Fruit* didymous, of 2 indehiscent cocci. *Seeds* erect; embryo sub-curved; endosperm horny.

Diffuse scabrid annual herbs, with 4-angled branches; leaves and leaf-like stipules in whorls of 4-6, lanceolate, somewhat pungent, margined; flowers small, sub-sessile.

Species 1, found in Europe, Persia, north Africa, and the Atlantic Islands; found as an introduction in South Africa.

8486

35. GALIUM, Linn.

Flowers sometimes unisexual. *Calyx* obsolete. *Corolla* rotate; lobes 4, rarely 3, valvate. *Disc* annular. *Stamens* 4, rarely 3, inserted on the corolla-tube; filaments short; anthers didymous, exserted. *Ovary* ovoid or globose, 2-chambered, with a single ovule in each chamber; styles 2, short; stigmas capitate. *Fruit* didymous, dry or sub-fleshy, smooth or tubercled, separating into 2 indehiscent mericarps. *Seeds* sub-exserted; embryo curved; endosperm horny.

Glabrous hispid or scabrous herbs, rarely shrubby at the base, with 4-angled branches; leaves and leaf-like stipules in whorls of 3 to many, ovate, obovate, lanceolate, or setaceous; flowers minute, in axillary and terminal cymes; bracts absent.

Species about 300, found in most parts of the world; 14 species in South Africa, fairly generally distributed.

8489

36. RUBIA, Linn.

Flowers sometimes unisexual. *Calyx* obsolete. *Corolla* rotate or sub-campanulate; lobes 5, valvate. *Disc* minute, tumid. *Stamens* 5, inserted on the corolla-tube; filaments short; anthers didymous, exserted. *Ovary* ovoid or globose, 2-chambered, or by abortion 1-chambered; style 2-fid, or styles 2; stigmas capitate. *Fruit* didymous, fleshy, 2- (rarely 1-) locular. *Seeds* sub-erect; embryo sub-curved; endosperm horny.

Herbs, sometimes shrubby at the base, often rigid, hispid or prickly; leaves and leaf-like stipules 4-6-whorled, sessile or petioled, lanceolate or obovate, rarely cordate; flowers small, in axillary and terminal cymes.

Species about 52, natives of the Mediterranean Region, Africa, Asia, and America: 3 species in South Africa, found in the Transvaal, Natal, Basutoland, and the eastern districts to Riversdale: also recorded from Queenstown.

174. VALERIANACEÆ.

Flowers bisexual, or unisexual by abortion. *Calyx* often small, sometimes obsolete, often enlarging as the flower matures and then variously lobed; lobes sometimes feathery. *Corolla* gamopetalous; tube often attenuated at the base, sometimes gibbous or spurred at the base, often widened at the throat; limb 3-5-fid, equal, oblique, or 2-lipped; lobes imbricate. *Stamens* 1-4, inserted above or below the middle of the corolla-tube, alternating with the corolla-lobes, often exserted; filaments free; anthers versatile, opening by 2 longitudinal slits. *Ovary* inferior, 3-chambered, but only 1 chamber fertile and containing a single pendulous ovule; style filiform; stigma sub-truncate, entire, or divided into 2-3 very short lobes.

Fruit dry, resembling an achene, crowned with the sometimes enlarged calyx. *Seed* pendulous ; embryo straight ; endosperm very thin, or 0.

Annual or perennial herbs, rarely half-shrubby, with a characteristic odour ; leaves opposite, very often radical or crowded at the base of the stem, entire or toothed, with the cauline leaves sometimes few, small, or 0, and the lower leaves pinnatifid, or once, twice, or three times pinnatisect ; stipules 0 ; flowers usually in dense dichotomous cymes ; bracts present ; bracteoles usually absent.

Genera 12 ; species over 300, mostly natives of the temperate and frigid zone of the northern hemisphere, plentiful in western America and the Andes.

Calyx in fruit produced into plumose bristles. 2. *Valeriana*, Linn.

Calyx if enlarged in fruit never produced into plumose bristles

1. *Valerianella*, Haller

8529

1. VALERIANELLA, Haller

Calyx-limb at the beginning often short or obsolete, afterwards becoming hardened or variously enlarged, erect, spreading, or globose-inflated, equal or oblique, entire, 3-6-toothed, or -lobed, 3-horned, or divided into recurved or hooked rigid awns, never plumose-setose. *Corolla-tube* short or rarely elongated, attenuated at the base, equal, or sometimes gibbous, never spurred ; limb 5-fid, spreading. *Stamens* 3. *Style* shortly or minutely 3-fid at the apex. *Fruit* with the empty loculi sometimes equalling or larger than the fertile loculus.

Annual herbs, with stems divided dichotomously ; radical leaves in a rosette, entire ; cauline leaves entire, toothed, or rarely incised-pinnatifid ; flowers in corymbose-panicled cymes, or cymes densely globose at the apex of the branches ; bracts present.

Species about 60, natives of the temperate and sub-tropical countries of the northern hemisphere ; 1 species in South Africa, apparently confined to the Swellendam district.

8532

2. VALERIANA, Linn.

Calyx-limb at first a little conspicuous, afterwards divided into 5-15 plumose-ciliate bristles. *Corolla-tube* narrowed to the base, short or rarely elongated, equal or slightly gibbous at the base ; limb 5-fid, spreading. *Stamens* 3, rarely 1-2 by abortion. *Fruit* compressed, with 1 nerve on the back and 2 nerves on the face, rarely with the empty loculi equalling the fertile loculus, at length crowned with the pappus-like calyx-limb.

Perennial herbs or half-shrubs, usually glabrous ; radical leaves entire or toothed ; the cauline leaves or all pinnatifid, or once, twice, or 3 times pinnatisect (pinnatifid in the South African species) ; flowers in cymes, or dense or interrupted spikes ; cymes sometimes laxly corymbose or variously panicled ; bracts free, rarely connate.

Species about 300, found in the temperate and cold regions of the northern hemisphere, also in North and South America along the Andes ; a few in Brazil, and India ; 1 species in South Africa, extending from the Transvaal through the coastal districts to the Cape ; also recorded from Basutoland, the eastern O.F.S., and Queenstown.

175. DIPSACACEÆ.

Flowers bisexual. *Calyx-tube* often constricted above the ovary ; limb cup-shaped, disciform, or divided into 5-20 stellately-spreading bristles. *Corolla* gamopetalous ; tube widened at the throat ; limb 2-5-fid, somewhat 2-lipped ; lobes unequal, imbricate. *Stamens* 2-4, inserted at the apex of the corolla-tube and alternating with the corolla-lobes, often exserted ; filaments free ; anthers versatile, 2-theccous, opening by longitudinal

slits. *Ovary* inferior, 1-chambered, with a single pendulous ovule ; style filiform ; stigma undivided, globose, disc-like, oblong, or elongated. *Fruit* a dry utricle, crowned with the enlarged persistent calyx-limb and enclosed in a cup-like involucl. *Seed* pendulous ; embryo straight ; endosperm fleshy, thin or copious.

Annual or perennial herbs, undershrubs, or rarely shrubs, glabrous or variously hairy ; leaves opposite or rarely whorled, entire, toothed, lobed, or cut ; stipules 0 ; flowers crowded in heads on a common receptacle, surrounded by an involucre, with each flower in a calyx-like dry persistent involucl.

Genera 9 ; species over 150, mostly massed in the Mediterranean Region and the Orient, less numerous in Africa, Europe, and Asia.

- | | |
|---|--------------------------------|
| 1. Involucral bracts in many rows | 2. <i>Cephalaria</i> , Schrad. |
| Involucral bracts in 1-3 rows | 2 |
| 2. Prickly plant ; stigma entire | 1. <i>Dipsacus</i> , Linn. |
| Glabrous or hairy plants ; stigma 2-lobed | 3. <i>Scabiosa</i> , Linn. |

8540

1. DIPSACUS, Linn.

Calyx-limb cup-shaped, 4-toothed or -lobed. *Corolla-limb* 4-fid, sub-equal, oblique or sub-2-lipped. *Stamens* 4, perfect. *Style* filiform ; stigma oblique or lateral. *Fruit* free within the involucl or more or less adnate to it, 8-ribbed, crowned with the persistent calyx-limb, or at length nude.

Biennial or perennial herbs, prickly or covered with rigid hispid hairs ; leaves opposite, deeply toothed or pinnatifid, with the terminal lobe often large ; head terminal, globose or oblong ; involucral bracts free, in 1-2 rows, often herbaceous, with the paleae of the receptacle rigidly subulate or spinescent at the apex and rigidly ciliate-hispid ; involucl 4-8-ribbed, more or less expanded into a spreading or concave membranous toothed or shortly and often villous limb.

Species about 12, natives of Europe, Asia, and Africa ; 1 species naturalised in South Africa.

8541

2. CEPHALARIA, Schrad.

Calyx-limb cup-shaped or disc-like, membranous, ciliate-hirsute, toothed or shortly many-lobed. *Corolla-limb* 4-fid, equal or oblique. *Stamens* 4, perfect. *Style* filiform ; stigma lateral, elongated. *Fruit* adnate to the base or to the middle of the involucl, 4-8-ribbed above, crowned with the persistent calyx-limb, or at length nude.

Annual or perennial herbs, often rigid, glabrous or pilose, rarely shortly setose, never prickly ; leaves entire, toothed, or lobed ; heads on long peduncles or rarely sessile, ovoid, globose, or depressed ; involucral bracts in many rows, with the paleae of the receptacle rigidly paleaceous or scarcely herbaceous, obtuse, acute or shortly setaceous-acuminate ; involucl 8-ribbed, with the ribs produced into small teeth, or only a little prominent at the apex.

Species about 40, natives of Europe, Asia, and Africa ; 6 species in South Africa, extending from the Transvaal and Natal through the eastern districts to the Cape.

8546

3. SCABIOSA, Linn.

Calyx-limb 4-6-toothed. *Corolla-limb* 4-5-fid. *Stamens* 4, perfect. *Style* filiform ; stigma 2-parted. *Fruit* united to the involucl at the base or beyond the base, crowned with the persistent calyx-limb.

Annual or perennial herbs, sometimes more or less shrubby at the base, variously hairy, rarely glabrous ; leaves entire, toothed, lobed, or cut ; heads peduncled, rarely sessile, terminal, depressed sub-globose or ovoid-conical ; involucral bracts free, in 1-2 rows, herbaceous ; receptacle paleaceous ; involucl with a saucer-shaped limb and 8-ribbed.

Species described about 122, natives of Europe, the Mediterranean Region, India, and Africa; 4 species in South Africa, extending from the Transvaal and Natal through the eastern districts to the Cape; also found in Basutoland, the O.F.S., Aliwal North, Queenstown, and recorded from Griqualand West.

176. CUCURBITACEÆ.

Plants monoecious or dioecious. *Calyx* rotate, campanulate, or tubular, 5- (rarely 3-6-) lobed; lobes imbricate. *Petals* 5, rarely 3 or 6, free or rarely joined, rarely clawed, sometimes lobed or fimbriate, valvate, or the margins involute. *Stamens* inserted in the mouth or at the base of the calyx-tube, free or variously joined, very often 3, rarely 5, very rarely 1, 2, or 4; filaments usually short; anthers free, or cohering, or in a head, 1- or 2-theous, often curved, flexuous or conduplicate, sometimes with the connective produced into an appendage. *Ovary* inferior, more rarely free at the apex, usually 3-chambered, more rarely 1-2- or spuriously 4-6-chambered, with many ovules in each chamber, rarely with 1-2 ovules in the 1-chambered ovaries; style terminal, simple or divided at the apex; stigma various. *Fruit* very often a berry, fleshy or corky (a *pepo*), indehiscent or rarely dehiscent, usually many-seeded. *Seeds* often flattened, smooth or variously pitted; embryo conforming to the shape of the seed; endosperm 0.

Herbs or undershrubs, prostrate or scandent, smooth, scabrid, or pubescent; leaves alternate, petioled, simple, lobed, palmatipartite, or pedate, often cordate; tendrils solitary, simple or 2 to multifid; flowers very often in panicles, rarely in racemes or in sub-umbels, often solitary, usually white or yellow, very rarely blue or red.

Genera 96; species over 700, found in all warm countries, especially the tropics.

Tribe **Zanoniceæ**: Stamens 5; filaments free; anthers oblong, 1-theous; ovary with 3 placentas, with the ovules pendulous and fixed on both sides of the thick placentas; fruit 1-locular, 3-valved at the apex; seeds winged (genus 1).

Tribe **Cucumerineæ**: Stamens 3, rarely 2 or 5, free or variously connate; anthers straight, curved, or flexuous; ovary with 3, rarely 2 or 5, placentas; ovules horizontal (genera 2-18).

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|---|---|
| 1. A rigid spiny apparently leafless shrub | 9. <i>Acanthosicyos</i> , <i>Welw.</i> |
| Prostrate or scandent herbs, rarely undershrubs; leaves well-developed | 2 |
| 2. Tendrils 2-3-fid, rarely multifid | 3 |
| Tendrils simple, very rarely 0 | 10 |
| 3. Petioles bi-glandular at the apex | 4 |
| Petioles not glandular at the apex | 5 |
| 4. Stamens inserted in the mouth of the calyx; staminodes present in the female flower | 13. <i>Sphaerosicyos</i> , <i>Hook.f.</i> |
| Stamens inserted on the calyx-tube; staminodes absent from the female flower | 17. <i>Lagenaria</i> , <i>Ser.</i> |
| 5. Stamens 4, with a rudimentary 5th. | 1. <i>Gerrardanthus</i> , <i>Harv.</i> |
| Stamens 3, rarely 5, but if so then all fertile | 6 |
| 6. Petals deeply fimbriated on the margins | 8. <i>Telfairia</i> , <i>Hook.</i> |
| Petals entire or nearly so, never fimbriated | 7 |
| 7. Stigmas 2, fan-like | 5. <i>Toxanthera</i> , <i>Hook.f.</i> |
| Stigmas 3, sometimes lobed, not fan-like | 8 |
| 8. Calyx-tube funnel-shaped, globose at the base; anthers cohering in an oblong or cylindric head | 18. <i>Peponium</i> , <i>Engl.</i> |
| Calyx-tube campanulate; anthers free or slightly cohering | 9 |
| 9. Male flowers in long-peduncled racemes | 12. <i>Luffa</i> , <i>Linn.</i> |
| Male flowers solitary | 14. <i>Citrullus</i> , <i>Neck.</i> |
| 10. Petiole biglandular at the apex. | 13. <i>Sphaerosicyos</i> , <i>Hook.f.</i> |
| Petiole not glandular at the apex; | 11 |

11. Calyx-tube with incurved scales at the base within 12
Calyx-tube without scales within 13
12. Ovules numerous 10. *Momordica*, Linn.
Ovules 2 11. *Rhaphanocarpus*, Hook. f.
13. Style surrounded by a cup-like disc ; anther-thecae straight or curved
2. *Melothria*, Linn.
Style not, or rarely surrounded by a disc, but if so then the anther-thecae flexuous, or the connective produced into a papillose appendage 14
14. Filaments connate, rarely free, but if so then rudimentary ovary 0
19. *Coccinia*, Wight & Arn.
Filaments free ; rudimentary ovary present 15
15. Anther-thecae straight or slightly curved 16
Anther-thecae bent into a simple or double horseshoe shape (flexuous) 19
16. Fruit opening by a lid 7. *Corallocarpus*, Welw.
Fruit indehiscent 17
17. Petiole with a small fringed stipule-like leaf at the base
3. *Blastania*, Kotschy & Peyr.
Petiole without a stipule-like leaf at the base 18
18. Small herbs, with 2 or more stems from an underground tuber ;
branches scarcely trailing ; male flowers on long pedicels ; petals
glandular 4. *Pisosperma*, Sond.
Herbs, with long prostrate or scandent branches ; male flowers in
racemes ; petals not glandular 6. *Kedrostis*, Medik.
19. Calyx-tube cylindric or funnel-shaped, globose at the base 20
Calyx-tube campanulate 21
20. Connective of anthers papillose or villous at the apex
16. *Trochomeria*, Hook. f.
Connective of anthers not produced 18. *Peponium*, Engl.
21. Connective of the anthers not produced 14. *Citrullus*, Neck.
Connective produced into a papillose appendage 15. *Cucumis*, Linn.

8555

1. GERRARDANTHUS, Harv.

Plants dioecious. *Male flowers* : *Calyx* small, rotate, 5-lobed. *Corolla* rotate, deeply 5-partite ; segments somewhat thick, linear-oblong, with 2 rather larger than the others. *Stamens* 4, with a fifth imperfect stamen ; filaments separate ; anthers small, 1-theous, all cohering, or cohering in parts, or all free. *Ovary* 0. *Female flowers* : *Calyx* and *corolla* as in the male. *Stamens* 0. *Ovary* elongated, 3-angled, sub-3-chambered, with few ovules in each chamber on thick placentas ; styles 3, short, sub-3-angled ; stigma 2-lobed, truncate. *Fruit* elongated, terete, broadly truncate and 3-valved at the apex. *Seeds* oblong, compressed, winged at the apex, granulated.

A high climbing plant, with a large tuberous root ; leaves membranous, hastate-cordate ; tendrils 2-fid ; flowers small ; male flowers on long pedicels in sub-umbellate fascicles.

Species 5, all African ; 2 species in South Africa, recorded from Natal and Komgha.

8562

2. MELOTHRIA, Linn.

(*Mukia*, Arn. *Zehneria*, Endl.)

Plants monoecious or dioecious. *Male flowers* : *Calyx* campanulate or tubular, 5-toothed or -lobed. *Corolla* rotate, 5-partite, glabrous, villous or pilose within ; segments ovate-oblong or linear-oblong, sometimes acute. *Stamens* 3, rarely 4-5, inserted at the base of or on the calyx-tube ; filaments short or somewhat long, glabrous or villous ; anthers oblong or orbicular, with one of the anthers 1-theous and the remainder 2-theous, rarely all 2-theous. *Ovary* gland-shaped, 3-lobed, globose or annular.

Female flowers: *Calyx* and *corolla* as in the male. *Stamens* rudimentary or minute, sometimes 3, very rarely bearing anthers. *Ovary* ovoid, sub-globose, globose, or fusiform, sometimes hispid, with few to many ovules on 3, more rarely 2, placentas; style inserted on an annular disc; stigmas thick, 2-3-lobed, or sometimes with 3 linear dilated stigmas. *Fruit* a berry, globose, ovoid, or fusiform, sometimes pendulous on a thread-like peduncle, sometimes beaked, few to many-seeded. *Seeds* oblong, obovate, or ovoid, compressed, sometimes pitted or tuberculed, smooth or marginate.

Herbs, prostrate or scandent, often scabrid or sub-tomentose; leaves obtuse, entire, 3-7-angled, toothed, lobed, or palmatisect, sometimes cordate at the base; tendrils simple; male flowers fascicled, in racemes or corymbs, rarely solitary; female flowers as in the male, but sometimes on long and slender pedicels.

Species 85, found in most warm countries; 11 species in South Africa, extending from the Transvaal to Natal, also to Griqualand West and S.W. Africa.

8564

3. BLASTANIA, Kotschy & Peyr.

Plants monoecious. *Male flowers*: *Calyx-tube* short, turbinate or sub-campanulate; lobes 5, small, subulate. *Corolla* rotate, 5-parted; segments ovate, sub-acute. *Stamens* 3, free; filaments very short; anthers small, one being 1-theous, the rest 2-theous, with the connective not produced. *Ovary* 0. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* 0. *Ovary* ovoid, with few ovules on 2-3 placentas; style columnar, not on an annular disc; stigmas 2-3. *Fruit* small, sub-globose or sub-quadrate, oblique, 2- or few-seeded, indehiscent. *Seeds* ovoid, strongly compressed, ovate and boat-shaped or concave above, convex beneath, smooth, with an acute margin.

Prostrate, rarely scandent herbs, scabrid, in the dried state often turning black; leaves orbicular, deeply cordate, 5-7-lobed or -partite; tendrils simple; male flowers in racemes; female flowers solitary, shortly pedicelled, in the same axil as the male; bracts stipule-like, orbicular or oblong, toothed or ciliate.

Species 2, found in Africa, Arabia, east India, and Ceylon; one species recorded from Ngamiland.

8566

4. PISOSPERMA, Sond.

Plants monoecious. *Male flowers*: *Calyx-tube* cylindric-campanulate, globose at the base; lobes 5, linear-oblong. *Corolla* 5-partite; segments elongated. *Stamens* 3, inserted on the calyx-tube; filaments short, free; anthers connate, with one 1-theous and the others 2-theous, with the connective scarcely produced and 2-fid. *Ovary* rudimentary, globose or depressed. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* rudimentary, linear. *Ovary* ovoid, with many ovules on 3 placentas; style elongated, without a basal disc; stigmas 3, thick, sub-2-lobed. *Fruit* sub-globose, beaked, indehiscent, 6-12-seeded, pubescent. *Seeds* swollen or sub-globose, marginate.

Small scabrid herbs, with a short stem and prostrate branches and a tuberous root; leaves palmately 5-lobed; tendrils simple; male flowers solitary or in racemes, long-pedicelled; female flowers solitary, shortly pedicelled.

Endemic; species 1, recorded from the eastern O.F.S.

8567

5. TOXANTHERA, Hook. f.

Plants monoecious. *Male flowers*: *Calyx-tube* shortly campanulate; lobes 5, triangular-ovate. *Corolla* rotate; segments ovate. *Stamens* 3; filaments very short, attached to the middle of the connective; anthers elongated, incurved; one anther 1-theous; the remaining two, 2-theous.

Ovary 0. *Female flowers*: *Calyx* as in male, but lobes subulate. *Corolla* as in the male. *Stamens* rudimentary, filiform, curved. *Ovary* slender, attenuated into a beak above, with many ovules on 2 placentas; style columnar, without a basal annular disc; stigmas 2, large, fan-shaped, deflexed, papillose. *Fruit* fusiform, fleshy, indehiscent, many-seeded. *Seeds* globose, smooth.

A slender scandent herb, sparsely scabrous or almost glabrous; leaves petioled, reniform-orbicular, 5-7-lobed, with the lobes rounded and remotely setose-toothed; tendrils 2-fid; male flowers in racemes; female flowers solitary.

An African genus of 3 species; 1 species found in Natal and 2 species near Lake Ngami.

8568

6. KEDROSTIS, Medik.

(Coniandra, Schrad.)

Plants monoecious or dioecious. *Male flowers*: *Calyx-tube* campanulate; lobes 5, short. *Corolla* rotate, 5-partite. *Stamens* 3, rarely 5, inserted on the calyx-tube; filaments short; anthers short, free, glabrous, with the connective usually prolonged at the apex, with one anther 1-theous and the others 2-theous, or when 5 anthers present then all 1-theous. *Ovary* 0, or gland-like. *Female flowers*: *Perianth* as in the male. *Stamens* 0, or rudimentary. *Ovary* ovoid, beaked, with few, rarely numerous, ovules on 2-3 placentas; style without a basal disc, or with an obscure disc; stigmas 2-3, large or narrow. *Fruit* a berry, ovoid, beaked, few- or many-seeded. *Seeds* swollen, sometimes marginate, smooth.

Prostrate or scandent herbs, glabrous, pilose, scabrid, or glandular, sometimes sub-fleshy; leaves entire, lobed, toothed, or partite; tendrils simple; male flowers in racemes or corymbs; female flowers solitary or clustered, shortly pedicelled.

Species 27, natives of Africa and eastern India; 17 species in South Africa, with a fairly general distribution.

8569

7. CORALLOCARPUS, Welw.

Plants monoecious. *Male flowers*: *Calyx-tube* broadly campanulate; lobes 5, short. *Corolla* 5-partite, with ovate-oblong segments. *Stamens* 3, inserted on the corolla-tube; filaments very short; anthers glabrous, entire or 2-partite, straight, with one anther 1-theous and the others 2-theous, with the connective sometimes produced. *Ovary* 0 or minute. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* 0 or minute. *Ovary* ovoid, beaked, 1-3-chambered, with few ovules in each chamber; style straight, without a basal disc; stigmas 2-3. *Fruit* a fleshy berry, ovoid, obtuse or beaked, opening by a lid, few-seeded. *Seeds* obovoid, swollen.

Prostrate herbs, sub-scabrous or sub-tomentose; leaves rounded or cordate, lobed or palmate; tendrils simple; flowers minute; male flowers clustered at the apex of a long peduncle; female flowers sessile or shortly pedicelled, solitary or clustered.

Species 34, natives of Asia and Africa, with a few species in America; 8 species in South Africa, found in the Transvaal, near Lake Ngami, and in S.W. Africa.

8588

8. TELFAIRIA, Hook.

Plants dioecious. *Calyx-tube* short, turbinate; lobes lanceolate, serrate or crenate. *Corolla* rotate, 5-partite; segments obovate-cuneate, papillose, fimbriate at the apex. *Stamens* 3; filaments short, free; anthers free or slightly cohering, broadly obovate-quadrate, curved, with the connective

dilated and papillose; one anther 2-theous, the remainder 4-theous. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* 0. *Ovary* oblong, swollen and lobed at the base, 3-5-chambered, with each chamber semi-divided, with many ovules in each chamber; style short, exserted; stigma capitate, 3-lobed. *Fruit* elongated, swollen at the base, with the peduncle intruse, acutely ribbed, 3-5-locular, many-seeded. *Seeds* large, orbicular, compressed, fibrous.

Scandent shrubs; leaves digitately 3-5-nate; leaflets oblong, eared at the base, repand-toothed or cut; tendrils 2-fid; male flowers in racemes; female flowers solitary; bracts present in the male flowers.

Species 2, natives of Africa and Mascarene Islands; 1 species cultivated in South Africa.

8590

9. ACANTHOSICYOS, Welw.

Plants dioecious? *Male flowers*: *Calyx-tube* turbinate; lobes 5, unequal, short, leathery, broadly ovate or sub-orbicular, horned. *Petals* 5, free, leathery, furrowed. *Stamens* 3, inserted in the mouth of the calyx; filaments short, free; anthers exserted, curved and flexuous, with the connective dilated; with one anther 1-theous, the rest 2-theous. *Ovary* 0. *Female flowers*: Unknown. *Fruit* globose, tuberculed, many-seeded. *Seeds* shortly oblong, swollen, smooth.

A much branched rigid thorny shrub; leaves much reduced so that the plant appears to be leafless; male flowers solitary or fascicled.

Endemic; species 1, found at Walfish Bay.

8591

10. MOMORDICA, Linn.

Plants monoecious or dioecious. *Male flowers*: *Calyx-tube* short, campanulate, with 2-3 oblong incurved scales at the bottom; lobes 5. *Corolla* often 5-partite to the base, rotate or broadly campanulate; segments obovate, ribbed. *Stamens* 3, very rarely 2 or 5; filaments short, free; anthers at first cohering, at length free, flexuous, rarely short, erect or curved, with the connective not produced, very often villous or papillose; one anther 1-theous, the remainder 2-theous. *Ovary* 0, or gland-like. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* 0, or represented by 3 glands at the base of the style. *Ovary* oblong or fusiform, with many ovules on 3 placentas; style slender; stigmas 3. *Fruit* oblong, fusiform or cylindric, indehiscent or 3-valved, few- or many-seeded. *Seeds* swollen or flattened, smooth or variously pitted.

Annual or perennial glabrous or pilose scandent herbs; leaves entire, lobed, or pedately 3-7-foliate; tendrils simple; male flowers solitary, or in corymbs, or racemes; female flowers solitary; male peduncle with a large sessile bract.

Species 61, mostly (42 species) African, but also sparsely distributed in other tropical countries; 5 species in South Africa, found in the Transvaal, Natal, Bechuanaland, and S.W. Africa; also recorded from Komgha.

8593

11. RHAPHANOCARPUS, Hook. f.

Plants monoecious. *Male flowers*: *Calyx-tube* very short, broadly campanulate, with incurved scales at the base; lobes 5. *Petals* 5, free, entire. *Stamens* 3-4, free, inserted in the mouth of the calyx-tube; filaments short; anthers linear, flexuous, rarely curved, connective not produced. *Ovary* 0. *Female flowers*: *Calyx* and *corolla* as in the male, but smaller. *Stamens* 0. *Ovary* slender, fusiform, sulcate, 1-chambered, with 2 pendulous ovules; style short, slender; stigma capitate, bilobed. *Fruit* slender, fusiform, 2-seeded, pilose. *Seeds* linear-oblong, compressed, with a hyaline membranous testa.

Slender annual herbs, prostrate or scandent; leaves ovate or cordate-sub-orbicular, entire or slightly lobed; tendrils simple; male flowers large, yellow, 2-5 at the apex of the peduncle and adnate to the petiole; female flower solitary or flowers 2-nate, basal, rarely apical, otherwise as in the male.

An African genus of 3 species; 2 species in South Africa, found in the Transvaal and S.W. Africa.

8594

12. LUFFA, Linn.

Plants monoecious. *Male flowers*: *Calyx-tube* campanulate or turbinate; lobes 5, triangular or lanceolate. *Petals* 5, free, spreading, obovate or obcordate, entire or erose. *Stamens* 3, rarely 4 or 5, inserted in the mouth of the calyx; filaments free, or 2 connate; anthers exserted, oblong or somewhat dilated, curved and flexuous, with the connective often dilated; one anther 1-theous; the rest 2-theous. *Ovary* gland-like, or 0. *Female flowers*: *Calyx-tube* produced above the ovary; calyx-lobes, as well as the corolla, as in the male. *Stamens* rudimentary. *Ovary* elongated, furrowed or angled, with many ovules on 3 placentas; style columnar; stigma 3-lobed. *Fruit* dry, oblong or cylindrical, acutely ribbed, or terete, smooth or prickly, fibrous within, 3-locular, opening by a terminal lid. *Seeds* oblong, compressed.

Annual herbs, glabrous, scabrid, or pubescent; leaves 5-7-lobed; tendrils 2 to multifid; male flowers in long-peduncled racemes; female flower solitary.

Species 10, found in all warm countries; 1 species sometimes cultivated in South Africa.

8597

13. SPHAEROSICYOS, Hook. f.

Plants dioecious. *Male flowers*: *Calyx-tube* short, turbinate; lobes triangular-ovate or subulate, glandular. *Corolla* deeply 5-parted; lobes obovate. *Stamens* 3, inserted in the mouth of the calyx; filaments free, recurved; anthers exserted, large, flexuous, with the connective broad; one anther 1-theous, the remainder 2-theous. *Ovary* 0. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* small, rudimentary. *Ovary* oblong in outline, with several ovules on 3 placentas; style columnar; stigma thick, 3-lobed. *Fruit* large, globose or sub-globose, smooth, pulpy within, many-seeded. *Seeds* obovoid, compressed, marginate, smooth.

Prostrate or scandent herbs or undershrubs, glabrous or sparsely pubescent; leaves lobed, with 2 glands at the top of the petiole; tendrils simple or 2-fid; male flowers solitary or in racemes.

Species 1, found in tropical Africa, also in Natal and the Transkei (*Luffa sphaerica*, Sond. Fl. Cap. ii. 490).

8598

14. CITRULLUS, Neck.

Plants monoecious. *Male flowers*: *Calyx-tube* broadly campanulate; limb 5-lobed. *Corolla* 5-partite to beyond the middle, sub-campanulate; segments oblong-ovate, obtuse. *Stamens* 3; filaments short, free; anthers slightly cohering, linear, flexuous, with the connective not produced; one anther 1-theous, the rest 2-theous. *Style* and *stigma* gland-like, sometimes large, or absent. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* 3, rudimentary, hair-like or ligulate. *Ovary* ovoid, with many ovules on 3 placentas; style short, columnar; stigmas 3, thick, reniform. *Fruit* globose, rarely oblong, indehiscent, fleshy or dry, many-seeded. *Seeds* oblong, flat, often immarginate.

Spreading perennial herbs, with a musky or foetid odour; leaves rounded, cordate, deeply 3-5-lobed, with the lobes lobulate; tendrils 2-3-fid, rarely undivided, sometimes also straight and spinescent; flowers yellow, all solitary.

Species 4, natives of Africa, Asia, and the Mediterranean Region ; 3 species in South Africa, recorded from Natal, the Transvaal, the Kalahari, S.W. Africa and from the Albany and Somerset East districts.

8599

15. CUCUMIS, Linn.

Plants monoecious. *Male flowers* : *Calyx-tube* turbinate or campanulate ; limb 5-lobed. *Corolla* sub-campanulate, deeply 5-lobed or 5-partite ; lobes oblong or ovate, acute. *Stamens* 3, free ; filaments short ; anthers oblong or linear, straight, curved, or flexuous, with the connective produced into a papillose appendage. *Ovary* gland-like. *Female flowers* : *Calyx* and *corolla* as in the male. *Stamens* 0. *Ovary* ovoid or globose, with many ovules on 3-5 placentas ; style short ; stigmas 3, obtuse. *Fruit* fleshy or with a bark-like covering, oblong, globose, or cylindric, terete or obtusely 3-angled, smooth or spiny, indehiscent or opening tardily by 3 valves, many-seeded. *Seeds* oblong, compressed, often immarginate.

Annual herbs, scandent or spreading, hispid or scabrid ; leaves entire, palmately 3-5-lobed, or -cut ; tendrils simple, sometimes straight and spinescent ; male flowers fascicled, rarely solitary ; female flowers solitary.

Species 38, mostly African ; a few found in America and Australia ; 17 species in South Africa, found in the Transvaal, Natal, and the Kalahari ; also recorded from the Uitenhage and Port Elizabeth districts, and near Alice and Queenstown.

8608

16. TROCHOMERIA, Hook. f.

Plants dioecious. *Male flowers* : *Calyx-tube* elongated, cylindric or funnel-shaped ; teeth 5, minute. *Corolla* rotate, deeply 5-parted ; segments linear, subulate, or linear-lanceolate, equalling or sub-equalling the tube. *Stamens* 3, inserted on the calyx-tube ; filaments short, free ; anthers included, linear-elongate, slightly cohering, compound, with the connective papillose or villous at the apex ; one anther 1-theccous, the rest 2-theccous. *Ovary* rudimentary, conical or globose. *Female flowers* : *Calyx* and *corolla* as in the male. *Stamens* 3, rudimentary, sometimes hair-like. *Ovary* oblong or ovoid, sometimes produced at the apex, with many ovules on 3 placentas ; style columnar, sometimes clavate at the apex ; stigma 3-lobed. *Fruit* oblong in outline, ovoid or sub-globose, fleshy, few-seeded. *Seeds* oblong or obovate, turgid or compressed, smooth or with 2 marginal lines, with the testa leathery or bony.

Scandent or prostrate herbs arising from a large root, often drying black ; leaves sometimes petioled, or sessile, entire, lobed, or partite, with sometimes stipule-like leaves at the base of the petiole ; tendrils simple or 0 ; male flower solitary, or flowers 2-nate or in racemes ; female flower solitary ; bracts and bracteoles sometimes present.

Species 19, all African ; 7 species in South Africa, extending from the Transvaal and Natal to Kingwilliamstown ; also found in parts of the central region and in the north-western districts.

8610

17. LAGENARIA, Ser.

Plants monoecious, rarely dioecious. *Male flowers* : *Calyx-tube* campanulate or funnel-shaped ; lobes 5, lanceolate or subulate, spreading. *Petals* 5, free, spreading, obcordate or obovate, retuse, mucronate. *Stamens* 3, inserted on the calyx-tube ; filaments free ; anthers included, slightly cohering, oblong, curved and flexuous, with the connective not produced narrow or dilated. *Ovary* 0. *Female flowers* : *Calyx* and *corolla* as in the male. *Stamens* 0. *Ovary* oblong in outline, ovoid, or cylindric, with many ovules on 3 placentas ; style short, thick ; stigmas 3, each 2-lobed. *Fruit* woody, indehiscent, many-seeded, with spongy flesh. *Seeds* compressed, marginate.

Climbing herbs, pubescent, with a musk-like odour; leaves petioled, ovate, reniform, cordate or sub-orbicular, toothed, with 2 glands at the apex of the petiole; tendrils 2-fid; flowers large, white, all solitary.

Species 1, native of Asia and tropical Africa, but cultivated in most warm countries.

8612

18. PEPONIUM, Engl.

(Peponia, Naud.)

Plants monoecious. *Male flowers*: *Calyx*-tube somewhat funnel-shaped, globose at the base; lobes 5, subulate or lanceolate. *Petals* free, obovate. *Stamens* 3, inserted on the calyx-tube; filaments free; anthers included, cohering in an oblong or cylindric head, conduplicate, not produced at the apex; one anther 1-theous, the rest 2-theous. *Ovary* gland-like. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* rudimentary. *Ovary* oblong in outline, with many ovules on 3 placentas; style columnar; stigma 3-partite. *Fruit* ovoid or cylindric, fleshy, many-seeded. *Seeds* obovoid, compressed.

Prostrate or scandent herbs, sub-villous; leaves entire or lobed, toothed; tendrils simple or divided; male flowers solitary or in racemes; female flowers solitary.

Species 21, all African; 2 species in South Africa, found in the Transvaal, Natal, Pondoland, Queenstown, and the O.F.S.

8628.

19. COCCINIA, Wight and Arn.

(Cephalandra, Schrad.)

Plants dioecious. *Male flowers*: *Calyx* short, campanulate or turbinate; teeth 5, subulate, acute or obtuse. *Corolla* campanulate, shortly 5-fid, with the lobes acute. *Stamens* 3, inserted on the tube or deep down in the calyx; filaments connate into a column, rarely free; anthers connate or cohering in a head, conduplicate. *Ovary* 0. *Female flowers*: *Calyx* and *corolla* as in the male. *Stamens* rudimentary, short or elongated. *Ovary* ovoid, or oblong or linear in outline, with many ovules on 3 placentas; style elongated; stigmas 3, 2-lobed or 2-partite. *Fruit* a berry, cylindric, or oblong in outline, terete, many-seeded. *Seeds* ovate, compressed, marginate, smooth or pitted.

Slender scandent or prostrate herbs, glabrous or somewhat rough; root often tuberous; leaves deltoid or rounded-cordate, angled or lobed, sometimes glandular beneath; tendrils slender, simple; flowers large, white or yellow; male flower solitary or flowers in sub-corymbs at the apex of a peduncle; female flower solitary.

Species about 40, natives of Asia and Africa; 10 species in South Africa, found in the Transvaal and Natal; also recorded from East London to the Uitenhage district, and from Griqualand West and Basutoland.

177. CAMPANULACEÆ.

Flowers bisexual, rarely unisexual by abortion, regular or irregular. *Calyx* 5- (rarely 3-4- or 6-10-) lobed or parted; lobes equal or unequal, valvate or imbricate. *Corolla* gamopetalous, tubular or campanulate, rarely funnel-shaped or rotate; limb regular, oblique, or 2-lipped, valvate or induplicate-valvate, rarely all free to the base. *Stamens* as many as the corolla-lobes and alternating with them, free from the corolla or inserted on the corolla-tube; filaments free, or connate at the base, often dilated at the base; anthers free or connate, glabrous, or all or some hairy or bearded, or with

apical bristles. *Ovary* inferior, semi-superior, or rarely superior, 2-5- (rarely 6-10-) chambered, very rarely 1-chambered, with many (rarely 2) ovules in each chamber; style simple, often hidden by the connate stamens; stigmas as many as the number of the chambers in the ovary. *Fruit* a capsule or berry, often crowned with the persistent calyx, variously dehiscent, rarely indehiscent. *Seeds* often small, smooth or reticulate-rugose; embryo straight; endosperm fleshy.

Herbs, shrubs, or undershrubs, very rarely trees; leaves alternate, rarely opposite or whorled, entire, toothed, more rarely lobed or cut; stipules 0; flowers often axillary and solitary, sometimes in racemes or lax panicles; bracts present or absent.

Genera 66; species over 1,000, widely dispersed throughout the world.

Tribe **Campanuleæ**: Corolla regular or rarely very slightly oblique; anthers free or rarely connate round the style; inflorescence various (genera 1-10).

Tribe **Cyphieæ**: Corolla irregular; anthers free; inflorescence racemose; floral bracts sometimes foliaceous (genus 11).

Tribe **Lobeliæ**: Corolla irregular; anthers connate round the style; inflorescence racemose, or flowers solitary (genera 12-15).

1. Anthers connate round the style; corolla 1-2-lipped, rarely sub-regular 2
 - Corolla regular; anthers free, rarely slightly cohering, but then corolla 2-lipped 4
2. Corolla-tube slit down to the base or nearly so 3
 - Corolla-tube not or shortly slit 15. *Laurentia*, Neck.
3. Fruit linear, 3-angled 14. *Grammatotheca*, Presl.
 - Fruit somewhat globose 13. *Lobelia*, Linn.
4. Corolla 2-lipped, slit down one side 12. *Cyphia*, Berg.
 - Corolla regular or almost so, not slit 5
5. Stamens inserted on the corolla-tube 6
 - Stamens free from the corolla-tube 8
6. Ovary 5-chambered; stigma 5-fid 10. *Microcodon*, A.DC.
 - Ovary 3-chambered; stigma 3-fid 7
7. Leaves minute and scale-like; ovules 2 in each ovary-chamber 6. *Siphocodon*, Turcz.
 - Leaves imbricate in 4 rows; ovules many in each ovary-chamber 4. *Rhigiophyllum*, Hochst.
8. Ovary 1-chambered, with 4 ovules 1. *Merciera*, A.DC.
 - Ovary 2-5-chambered, with usually many ovules in each chamber 9
9. Fruit opening by a large apical pore 2. *Roelia*, Linn.
 - Fruit opening by valves or longitudinal slits 10
10. Fruit long-cylindric, opening by longitudinal slits 3. *Prismatocarpus*, L'Her.
 - Fruit not long-cylindric, opening by valves 11
11. Petals free or almost so 12
 - Petals joined to form a distinct tube 13
12. Annual herbs; flowers in lax racemes or panicles 8. *Cephalostigma*, A.DC.
 - Small shrubs or perennial herbs; flowers solitary, sub-fascicled, or in lax corymbs 9. *Lightfootia*, L'Her.
13. Corolla-tube campanulate or funnel-shaped 7. *Wahlenbergia*, Schrad.
 - Corolla-tube cylindric 14
14. Ovary 5-chambered; stigma 5-fid 10. *Microcodon*, A.DC.
 - Ovary 2-3-chambered; stigma 2-3-fid 15
15. Ovary 2-chambered; stigma 2-fid 5. *Treichelia*, Vathe
 - Ovary 3-chambered; stigma 3-fid 11. *Theillera*, Phillips

8661

1. MERCIERA, A.DC.

Calyx 4-5-parted. *Corolla* tubular; tube slender; limb narrowly 4-5-lobed. *Stamens* 4-5, free from the corolla; filaments filiform, much longer than

the anthers; anthers free. *Ovary* inferior, turbinate or sub-globose, 1-chambered or imperfectly 2-chambered, with 4 erect ovules in each chamber; style filiform, usually exserted; stigma shortly 2-fid. *Fruit* a capsule, 1-seeded by abortion, crowned with the persistent calyx.

Small undershrubs, hirsute or glabrous; leaves linear, rigid, crowded, often fascicled, ciliated; flowers solitary, shortly peduncled or sub-sessile in the leaf-axils; bracts 2.

Endemic; species 4, found in the south-western districts.

8662

2. ROELLA, Linn.

Calyx 5-partite, with the lobes often toothed. *Corolla* campanulate or funnel-shaped, 5-lobed. *Stamens* free from the corolla; filaments often dilated or scale-like at the base; anthers free. *Ovary* inferior, oblong or shortly cylindric, 2-chambered, with many ovules in each chamber; stigmas 2, thick. *Fruit* a capsule, inferior, 2-locular, perforated by the permanent base of the style and therefore appearing as covered by a concave operculum, at length dehiscing by a large hole at the apex, without valves. *Seeds* numerous, angled, scabrous, thick.

Undershrubs, rarely herbs; leaves alternate, scattered, small or narrow, often rigidly recurved and fascicled, entire or ciliate-toothed; flowers sessile, solitary or glomerate.

Endemic; species 15, mostly in the south-western districts, but extend to the Uitenhage district and then from East London to Natal and the Transvaal.

8663

3. PRISMATOCARPUS, L'Her.

Calyx 5-partite, with lanceolate acute lobes. *Corolla* funnel-shaped or sub-campanulate, 5-lobed or 5-fid. *Stamens* free from the corolla; filaments sometimes scale-like and dilated at the base; anthers free. *Ovary* inferior, ovoid, 2-chambered, with many ovules in each chamber; style persistent at the base; stigma 2-lobed. *Fruit* a capsule, prismatic or cylindric, elongated, 2-locular, splitting from the top to the base into 5 segments. *Seeds* oblong, compressed, dotted.

Sub-shrubs, more rarely perennial herbs; leaves alternate, small, often narrow, often fascicled in the lower part of the stem; flowers solitary, or glomerate at the apices of short branches, or in dichotomous panicles.

Endemic; species 20, mainly south-western, but extend to Grahamstown.

8664

4. RHIGIOPHYLLUM, Hochst.

Calyx 5-partite, with lanceolate acute lobes. *Corolla-tube* very long and very narrow; limb spreading, 5-fid; lobes oblong. *Stamens* fixed high up on the corolla-tube; anthers free. *Ovary* inferior, ovoid, 3-chambered, with many ovules in each chamber; style long, filiform, exserted; stigma 3-fid, with the lobes recurved at the apex. *Fruit* a capsule, inferior, operculate, crowned with the persistent style-base.

A rigid shrub; leaves imbricate in four rows, squarrose, entire; flowers in a terminal head, intermixed with rigid leaf-like bracts; bracteoles 2.

Endemic; species 1, recorded from the Caledon district.

8665

5. TREICHELIA, Vatke

(*Leptocodon*, Sond.)

Calyx-lobes 5, narrow. *Corolla-tube* cylindric; limb short, sub-spreading, 5-fid. *Stamens* free from the corolla; filaments scarcely dilated; anthers free. *Ovary* inferior, sub-globose, 2-chambered, with a few ovules in each

chamber; style filiform, with the base dilated and persistent; stigma 2-fid, with linear lobes. *Fruit* a capsule, inferior, cylindric, many-seeded, covered by the solid conical base of the style.

A dwarf annual hairy herb; leaves sparse, alternate, linear, denticulate, ciliate at the base; flowers small, in dense terminal sub-heads, intermixed with long linear bracts.

Endemic; species 1, confined to the south-western districts.

8667

6. SIPHOCODON, Turcz.

Calyx 5-partite. *Corolla* slender, tubular, 5-lobed. *Stamens* fixed high up on the corolla-tube; filaments short, filiform; anthers free. *Ovary* inferior, turbinate, 3-chambered, with 2 pendulous ovules in each chamber; style filiform; stigmas 3, 3-fid, with linear lobes. *Fruit* a capsule, inferior, crowned with the persistent calyx, opening transversely and the lid falling off with the upper part of the calyx.

A rigid glabrous undershrub, with the habit of a *Thesium*; branches virgate, sub-leafless; leaves alternate, minute, scale-like; flowers blue, in shortly peduncled racemes, with the racemes often panicle.

Endemic; species 2, recorded from the Caledon and Bredasdorp districts.

8668

7. WAHLENBERGIA, Schrad.

Calyx 5- (rarely 3-4-) partite. *Corolla* campanulate, funnel-shaped, tubular, or sub-rotate, shortly 5- (rarely 3-4-) fid, rarely divided to the middle or deeper. *Stamens* 3-5, free from the corolla; filaments often dilated at the base; anthers free. *Ovary* inferior or semi-superior, hemispherical, turbinate, or obconic-oblong, 2-5-chambered, with many ovules in each chamber; style included, pilose, particularly on the upper part; stigma 2-5-fid, with short often linear lobes. *Fruit* a capsule, inferior or semi-superior, 2-5-locular, opening at the apex by as many valves as there are loculi.

Annual or perennial herbs, sometimes woody at the base; leaves alternate, rarely opposite, usually more numerous in the lower part of the plant; flowers solitary, on usually long axillary or terminal peduncles; peduncles sometimes panicle.

Species about 200, natives of Africa, western Europe, Madagascar, tropical and eastern Asia, Australia, New Zealand, and South America; 156 species in South Africa, found mostly in the coastal belt from Clanwilliam to Natal and then to the Transvaal; poorly represented in the central districts.

8669

8. CEPHALOSTIGMA, A.DC.

Calyx 5-partite. *Corolla* 5-partite almost to the base; lobes narrow. *Stamens* free from the corolla; filaments dilated at the base; anthers free. *Ovary* inferior, globose, 2-3-chambered, with many ovules in each chamber; style shortly conical at the base; stigma 2-3-fid, with the lobes short. *Fruit* a capsule, crowned with the persistent calyx-lobes, loculicidally 2-3-valved.

Annual herbs, often hairy; leaves alternate, sessile; flowers very small, in lax racemes or panicles; pedicels filiform.

Species about 7, natives of Africa, eastern India, and South America; 2 species recorded from South West Africa.

8670

9. LIGHTFOOTIA, L'Her.

Calyx 5-cleft. *Corolla* deeply 5-fid, or almost 5-partite to the base; lobes narrow. *Stamens* free from the corolla; filaments dilated at the base,

ciliate; anthers free. *Ovary* inferior, hemispherical or turbinate, rarely longer and obconic, semi-superior or almost superior, 3- or 5-chambered, with a few ovules in each chamber; style thickened near the apex; stigma 3-fid, with short narrow lobes. *Fruit* a capsule, conical, or elongated between the elongated calyx-lobes, loculicidally 3- or 5-valved.

Small shrubs, more rarely herbaceous perennials; leaves alternate, rarely opposite, often fascicled, small, often narrow, often squarrose, entire or rigidly toothed; flowers axillary and terminal, solitary, shortly pedicelled or subsessile, sometimes sub-fascicled or in lax corymbs.

An African genus of about 58 species; 26 species in South Africa, common in the coastal belt from Clanwilliam to Natal and in the Transvaal; poorly represented in the central districts.

8677

10. MICROCODON, A.DC.

Calyx 5-partite; lobes narrowly sub-leafy. *Corolla-tube* cylindric; limb spreading, 5-fid. *Stamens* 5, adnate to or free from the corolla-tube; filaments slender at the base; anthers free. *Ovary* inferior or semi-superior, obovoid or globose, usually hispid, 5-chambered, with few ovules in each chamber; style filiform; stigma 5-fid, with linear lobes. *Fruit* a capsule, inferior or semi-superior, loculicidally 5-valved.

Small annual herbs; leaves alternate or sub-opposite, linear; flowers small, in lax corymbs, or in head-like glomerules at the apex of the branches.

Endemic; species 4, found in the south-western districts, but extending to Riversdale.

8677a

11. THEILERA, Phillips

Calyx 5-partite; lobes narrowly sub-leafy. *Corolla-tube* cylindric; limb spreading, 5-fid. *Stamens* 5, free from the corolla-tube; filaments slender at the base. *Ovary* inferior, obovoid, 3-chambered, with a few ovules in each chamber; style exerted, filiform, glabrous; stigma ellipsoid, thicker than the style, 3-fid, with oblong lobes. *Fruit* not seen.

A small lax shrub, with long slender branches occasionally branched; leaves alternate, fascicled; flowers sessile, solitary, axillary or terminal.

Endemic; species 1, only recorded from the Mossel Bay and George districts (Type species *T. Guthriei*, Phillips = *Wahlenbergia Guthriei*, L. Bolus).

8681

12. CYPHIA, Berg.

Calyx-lobes ovate to linear, sometimes toothed, rarely pectinate. *Corolla* 2-lipped, tubular, or the segments free to the base; lobes linear or lanceolate, acute or obtuse, sometimes acuminate. *Stamens* more than, or less than half as long as the corolla; filaments either free or sometimes slightly connate at the base, usually hairy and widened below; anthers loosely cohering round the style, usually pilose and bearded. *Ovary* half-inferior, turbinate or campanulate, 2-chambered, with many ovules in each chamber; style passing gradually into the ovary, rarely almost obsolete; stigma capitate, terminal or oblique. *Fruit* a capsule, partly enclosed by the persistent calyx.

Herbaceous perennials, often with tuberous roots, erect or twining; leaves cauline or more rarely wholly radical, alternate, entire or divided, serrated, toothed, or crenate; flowers in distinct terminal racemes, or arranged in a racemose manner in the axils of the upper leaves, rarely in 2-4-flowered axillary umbels; bracts various; bracteoles 2.

An African genus of over 30 species; 25 species in South Africa, found in the coastal belt from Clanwilliam to Natal, but extend into Namaqualand, S.W. Africa, and the Transvaal; rare in the central districts.

8694

13. LOBELIA, Linn.

(Including *Parastranthus*, G. Don *Mezleria*, Presl *Isolobus*, A. DC ;
Dobrowskyia, Presl ; *Monopsis*, Salisb.)

Calyx 5-cleft or 5-lobed. *Corolla* sub-regular or 1-2-lipped, cleft on one side, 3-5-lobed, -cleft, or -partite ; tube somewhat cylindric or funnel-shaped ; upper lip 3-lobed or of 2 distinct clawed petals, sometimes smaller than the lower lip ; lower lip 3-lobed, or the petals connate into a 3-fid lip, often spreading or pendulous. *Filaments* sometimes connate ; anthers connate, with the two lower terminated by a single bristle or bearded, or all bearded. *Ovary* inferior or half-superior, cylindric, obconic, turbinate, or hemispherical, 2-chambered, with many ovules in each chamber ; style often elongated ; stigma bifid or 2-lobed. *Fruit* a capsule, 2-locular, 2-valved, often crowned with the persistent calyx.

Annual or perennial herbs, or sub-shrubs ; leaves alternate, opposite, or whorled, entire or variously toothed ; flowers sub-sessile or pedicelled, axillary and solitary, clustered at the ends of the branches, or arranged in leafy spikes or racemes.

Species about 329, natives of Africa, the Comoro Islands, and also of most warm and temperate countries ; 54 species found in South Africa, common in the coastal region from Clanwilliam to Natal ; also found in the Transvaal and the eastern mountains ; poorly represented in the central districts.

8696

14. GRAMMATOTHECA, Presl

Calyx 5-parted, spreading or reflexed. *Corolla* tubular, 2-lipped ; tube often cleft the whole length ; limb 5-parted, with the upper lip of 2 linear erect lobes, and the lower lip longer, reflexed, 3-lobed. *Anthers* connate, all bearded. *Stigma* 2-lobed. *Fruit* a 1-locular linear 3-angled capsule, many-seeded, 3-valved, with the valves cohering at the base and apex and two of them placentiferous in the middle.

Glabrous herbaceous plants ; leaves sessile, linear or lanceolate ; flowers solitary, sessile, axillary.

Species 2, one of which occurs in South Africa from the Cape to Natal, and the other in Australia. (NOTE.—Possibly the Australian and the South African plant may be the same species.)

8699

15. LAURENTIA, Neck.

(*Enchysia*, Presl)

Calyx 5-partite or 5-toothed, sub-equal. *Corolla* sub-equal or 2-lipped ; tube entire or shortly cleft, 5-lobed, when 2-lipped the upper lip of 2 lobes, and the lower lip larger 3-lobed and reflexed. *Filaments* sometimes connate in the middle ; 2 lower anthers somewhat hairy or terminated by bristles. *Ovary* inferior or semi-superior, sometimes turbinate or ovoid, or oblong in outline, 2-chambered, with many ovules in each chamber. *Stigma* shortly bifid. *Fruit* slender, crowned with the persistent calyx, loculicidally 2-valved.

Small herbs, sometimes creeping, with filiform branches ; leaves alternate, narrow ; flowers pedicelled, axillary and solitary, or in racemes at the ends of the branches.

Species 10, natives of Africa, the Mediterranean Region, the Canary Islands, and North America ; 5 species in South Africa, extending from Van Rhynsdorp to Riversdale ; also recorded from Grahamstown and a little further east, and then from Basutoland.

178. GOODENIACEÆ.

Flowers bisexual, irregular or rarely regular. *Calyx* 5-lobed, or with the lobes very small or absent. *Corolla* gamopetalous, 5-lobed, 2-lipped, rarely 1-lipped; lobes valvate. *Stamens* 5, alternating with the corolla-lobes, usually free from the corolla-tube; anthers free or rarely connate round the style, 2-theous, opening by longitudinal slits. *Ovary* usually inferior, 1-2- (rarely 4-) chambered, with 1-2 or many erect or ascending rarely pendulous ovules in each chamber; style simple, rarely 2-fid; stigma surrounded by a fringed cup. *Fruit* a drupe, nut, or capsule. *Embryo* straight; endosperm somewhat fleshy, rarely almost absent.

Herbs or undershrubs, rarely shrubs; leaves alternate, sometimes all radical, very rarely opposite, entire, toothed, or rarely pinnatifid; stipules 0; flowers axillary, or in terminal spikes, racemes, or panicles; bracts present.

Genera 13; species about 300, almost all Australian, a few in New Zealand and Antarctic America; also found in the Pacific Islands and tropical Asia. One genus only is represented in Africa and India.

8716

1. SCAEVOLA, Linn.

Calyx 5-cleft or 5-toothed, rarely sub-entire. *Corolla* oblique, with the tube split to the base; lobes 5, sub-equal, or the 2 upper shorter. *Anthers* free. *Ovary* inferior or almost so, turbinate, ovoid, or globose, 2-chambered, with a solitary erect ovule in each chamber, or 1-chambered with 1-2 basal erect ovules; stigma truncate, or divaricately 2-lobed. *Fruit* a drupe.

Herbs, undershrubs, or shrubs; leaves alternate (in the South African species), rarely opposite, entire or toothed; flowers axillary, solitary, or in few-flowered cymes.

Species about 60, natives of Australia, Asia, the Pacific Islands, India, and Africa; 1 species in South Africa, found on the sea-shore from Riversdale to Natal.

179. COMPOSITÆ.

Flowers bisexual, or unisexual by abortion, generally many, rarely solitary, in a head surrounded by an involucre of bracts. *Calyx* absent or represented by a pappus. *Corolla* gamopetalous; tube elongated, or short, or almost 0; limb with 4-5 (rarely 2-3) lobes or teeth, rarely 1- or 2-lipped; the corolla of various florets on the same head sometimes differing, some being filiform or strap-shaped, more rarely all the florets with strap-shaped corollas. *Stamens* as many as the corolla-lobes and alternating with them, inserted on the corolla-tube; filaments free or connate; anthers connate to form a tube round the style, obtuse or tailed at the base. *Ovary* inferior, 1-chambered, with a solitary basal erect ovule; style filiform, sometimes undivided in the sterile flowers; style-branches filiform or flattened, acute, obtuse, or truncate at the apex, with or without an apical appendage, glabrous, or variously hairy, or papillose. *Pappus* various, sometimes of bristles, or paleae, or both, or 0. *Fruit* a small cypsela,* usually crowned with the pappus when present, very rarely a drupe. *Seed* erect; embryo straight.

* In the key and descriptions the fruit is called an "achene," but the term is not strictly correct when applied to the fruit of the *Compositae*.

Herbs or shrubs, rarely trees; leaves opposite or alternate, rarely whorled, simple, more rarely compound; stipules 0; flower-heads terminal or axillary, solitary or variously grouped, sometimes consisting only of tubular florets (homogamous), or of tubular and marginal female florets (heterogamous and discoid), or tubular and strap-shaped ray-florets (heterogamous and radiate); receptacle smooth, honeycombed, pitted, setose, or covered with paleae, rarely fleshy; involucre bracts in 1 to many rows, free or connate.

A very large cosmopolitan family of about 900 genera and over 13,000 species.

The *Compositæ* comprise the largest family amongst flowering plants and include herbs, shrubs, climbers, trees (e.g. *Brachylaena*), succulent xerophytes, etc. Although the family characters of the flowers and inflorescence are well marked, there are numerous variations. In the first the number of flowers, though usually great, may be reduced to two (e.g., *Disparago* and *Xanthium*) or even one (e.g., *Stoebe* and *Corymbium*) in each capitulum. The involucre in each capitulum is adapted in different genera to different functions; frequently it is green and performs the same functions for the capitulum as the calyx does in most flowers, while the ligulate flowers represent the show-apparatus. In other cases (e.g., *Helichrysum*, *Helipterum*) the involucre forms the show-apparatus, in others again it is spiny and may assist in the dispersal of the seeds (e.g., *Xanthium*). The calyx may be absent, or represented by leaf-like structures, or more frequently by hairs or bristles. The corolla is either regular as in the usual tubular flowers, or it may be 2-lipped (as found, e.g., in *Gerbera* and allied genera). These 2-lipped flowers lead on the one hand to the ligulate flowers of the *Tubulifloræ* (e.g., *Senecio*) in which only 3 petals are developed and on the other hand to the flowers of the *Ligulifloræ* (e.g., *Sonchus* and *Lactuca*) in which all 5 petals are developed and spread out in one plane. Not all flowers bear sexual organs in every genus. They are often sterile. Unisexual flowers are also common. Taking these characters into consideration, a large number of combinations are found in capitula, amongst which the following may serve as examples:—

1. All flowers bisexual and tubular (*Vernonia*).
2. All flowers bisexual and 2-lipped (*Oldenburgia*, in which however, the disc-flowers are nearly regular).
3. All flowers bisexual and ligulate (*Sonchus*, *Lactuca*).
4. Flowers all tubular; central bisexual; outer female (*Gnaphalium*).
5. Flowers all tubular, unisexual; plants dioecious (*Brachylaena*, *Tarchonanthus*).
6. Tubular flowers bisexual; ligulate flowers female (a very common combination, e.g., in *Senecio* and numerous other genera).
7. Tubular flowers bisexual; ligulate flowers sterile (*Cypselodontia*, *Bidens*).
8. Flowers all tubular; central male; peripheral female (species of *Conyza* and allied genera).
9. Central flowers tubular and male; peripheral ligulate and female (*Osteospermum*, *Garuleum*).
10. Central flowers tubular and bisexual, then bisexual 2-lipped flowers, and on the outside 2-lipped female flowers (*Gerbera*).

In rare cases the whole capitulum becomes a pseudocarp (e.g. *Xanthium*). Usually each flower bearing a gynæcium forms an achenial fruit, a cypsela, often crowned with the pappus. This is in rare cases winged (e.g., *Tripteris*). In *Dimorphotheca* the fruits of the ray flowers are obconic, those of the disc flowers flattened and winged. Very rarely the fruits are drupaceous (e.g. *Osteospermum*). Not unfrequently the achenes are more or less covered with hairs which must not be confused with the pappus (e.g., *Arctotis*, *Haplocarpha* and allied genera, *Lachnospermum*, etc.).

Tribe **Vernoniæ**: Heads homogamous; florets tubular; anthers sagittate at the base; style-branches subulate, hairy; leaves very often alternate; corolla never yellow; pappus often of bristles or paleae (genera 1-6).

Tribe **Eupatoriæ**: Heads homogamous; florets tubular; anthers sub-entire at the base; style-branches sub-terete, obtuse, shortly papillose; leaves opposite or alternate; pappus often of bristles (genera 7-10).

- Tribe Asteroideae** : Heads heterogamous, radiate or discoid, or homogamous by the absence of the ray-florets ; anthers obtuse at the base, sub-entire ; style-branches flattened, with a terminal appendage ; leaves very often alternate ; receptacle very often nude ; disc-florets very often yellow ; ray florets similarly or differently coloured (genera 11-31).
- Tribe Inuloideae** : Heads heterogamous, radiate or discoid, or homogamous by the absence of the ray-florets ; anthers tailed at the base ; style-branches linear, obtuse, unappendaged, or the style of the sterile florets undivided ; leaves often alternate ; disc-florets very often yellow ; ray-florets similarly, rarely differently, coloured (genera 32-97).
- Tribe Helianthoideae** : Heads heterogamous, radiate, or rarely discoid or homogamous by the absence of the rays ; receptacle paleaceous, or rarely nude in the disc with sterile flowers ; anthers not tailed at the base or very shortly 2-mucronate ; style-branches truncate, or appendiculate, or the style of the sterile florets undivided ; achenes 3-4-angled, terete or often variously compressed ; pappus of 2-4 slender or sub-paleaceous bristles, with or without free or connate intermediate scales, or 0 ; leaves opposite or rarely alternate ; disc florets very often yellow ; rays similarly or rarely differently coloured (genera 97-113).
- Tribe Helenioideae** : Heads heterogamous, radiate, or rarely discoid or homogamous by the absence of the rays ; receptacle nude ; anthers without tails ; style-branches in the bisexual florets truncate or appendaged ; achenes narrow or turbinate, 4-5-angled or 8 to many ribbed ; pappus of paleae, rarely of bristles or awns, rarely 0 ; leaves opposite or alternate ; involucre bracts in 1-2 rows, rarely in 3-4 rows, herbaceous or membranous ; disc florets very often yellow ; rays similarly, rarely differently, coloured (genera 114-116).
- Tribe Anthemideae** : Heads heterogamous, radiate or discoid, or homogamous by the absence of the rays ; involucre bracts in 2 to many rows, dry or scarious at the apex ; receptacle paleaceous or nude ; anthers without tails ; style-branches truncate ; pappus, when present, crown-like, rarely shortly paleaceous ; leaves very often alternate ; disc florets yellow ; rays similarly or differently coloured (genera 117-143).
- Tribe Senecionideae** : Heads heterogamous, radiate or discoid, or homogamous by the absence of the rays ; the inner bracts of the involucre in 1 row, sub-equal, with the outer small or 0, or rarely imbricate in many rows ; receptacle often nude ; anthers not tailed or shortly 2-mucronate ; style-branches of the bisexual florets truncate or appendaged ; pappus very often setose ; leaves often alternate ; disc florets often yellow ; rays similarly or differently coloured (genera 144-159).
- Tribe Calenduleae** : Heads radiate ; involucre bracts in 1-2 rows, narrow, sub-equal ; receptacle nude ; anthers sub-tailed ; style-branches of the bisexual florets truncate, or in the sterile florets undivided ; pappus 0 or rarely woolly ; leaves very often alternate, sometimes radical (genera 160-164).
- Tribe Arctotideae** : Heads radiate or rarely homogamous ; involucre bracts in many rows, often scarious or spinescent at the apex ; receptacle nude, paleaceous or honeycombed ; anthers sub-tailed ; style-branches of the bisexual florets rounded and obtuse, rarely truncate at the apex, or the style of the sterile florets undivided ; pappus 0, or of paleae, or crown-like ; leaves alternate, sometimes radical (genera 165-179).
- Tribe Cynaroideae** : Heads usually homogamous ; involucre bracts in many rows, imbricate, often scarious, spiny, or produced into leaf-like appendages at the apex ; receptacle very often fleshy, densely setose or fimbriate, rarely shortly honeycombed ; corolla-limb narrow, deeply 5-fid ; anthers tailed ; style sub-entire or the branches short, papillose, often hirsute or thickened below the point of division ; pappus of bristles, paleae, or rarely 0 ; leaves alternate, often spiny (genera 180-185).
- Tribe Mutisieae** : Heads heterogamous or homogamous, the florets equal or ray-like ; involucre bracts often in many rows, unarmed or rarely spinescent ; receptacle rarely paleaceous ; corolla 2-lipped or the limb deeply 5-fid ; anthers very often tailed ; style-branches rounded or truncate and unappendaged at the apex ; pappus of bristles, paleae, or rarely 0 ; leaves alternate, sometimes radical, rarely opposite (genera 186-188).
- Tribe Cichorieae** : Heads homogamous ; florets equal or sub-ray-like ; involucre various ; receptacle without paleae or with deciduous paleae ; corolla ligulate, truncate and 5-toothed at the apex ; anthers not tailed or shortly awned ; style-branches slender ; pappus of bristles, paleae, or 0 ; leaves alternate, sometimes radical ; juice often milky (genera 189-197).

1. Florets all tubular, or heads with marginal ligulate rays or filiform florets 2
 Florets all ligulate 321
2. Leaves opposite, rarely verticillate or opposite the branches . . . 3
 Leaves alternate, sometimes radical 56
3. Rays conspicuous 4
 Rays absent or inconspicuous, or head discoid with marginal female florets 32
4. Pappus present 5
 Pappus absent 24
5. Individual heads grouped within a common involucre **119. Oedera, Linn.**
 Heads free, not grouped and surrounded by a common involucre . . . 6
6. Involucral bracts in 1 row, connate; leaves with a pungent odour, with immersed oil-glands . . . **116. Tagetes, Linn.**
 Involucral bracts in 2 to many rows; leaves not with a pungent odour, nor with immersed oil glands 7
7. Receptacle with distinct paleae subtending the florets 8
 Receptacle naked, or sometimes setose or fimbriate 19
8. Pappus of paleae, more rarely coroniform with a bristly margin . . . 9
 Pappus of bristles, or of 1-4 awns 13
9. Pappus unequal, with 2 scales longer than the others and longitudinally folded **94. Callilepis, DC.**
 Pappus equal or coroniform, with 2 scales produced into bristles . . . 10
10. Pappus saucer-shaped, toothed, or divided into squamulae, sometimes with 2 scales produced into bristles . . . **105. Wedelia, Jacq.**
 Pappus scales distinct, sometimes plumose-ciliate, if connate into a cup then involucral bracts in many rows 11
11. Annual or perennial herbs; pappus plumose-ciliate 12
 Shrubs; pappus not ciliate **71. Relbania, L'Her.**
12. Leaves deeply cut; rays yellow **113. Tridax, Linn.**
 Leaves slightly serrate; rays white . . . **113a. Galinsoga, Ruiz & Pav.**
13. Peduncle swollen beneath the head **102. Zinnia, Linn.**
 Peduncle not swollen beneath the head 14
14. Pappus bristles with retorse barbs **111. Bidens, Linn.**
 Pappus bristles without retorse barbs, if barbed then heads large and showy 15
15. Leaves pinnatisect; heads laxly corymbose-panicled or solitary . . . 16
 Leaves often toothed, rarely 3-fid or hastately 3-lobed; heads peduncled, terminal, or in the axils of the upper leaves . . . 17
16. Heads solitary; ray florets yellow **108. Coreopsis, Linn.**
 Heads laxly corymbose-panicled; ray florets not yellow **112. Cosmos, Cav.**
17. Glabrous annual herbs **107. Spilanthes, Jacq.**
 Herbs or undershrubs, scabro-pubescent, hirsute, or villous . . . 18
18. Pappus of 1-2 small setiform awns **105. Wedelia, Jacq.**
 Pappus of 2 to many unequal caducous bristles . . . **106. Melanthera, Rohr**
19. Ray florets female; receptacle rarely setose 20
 Ray florets neuter; receptacle setose 23
20. Pappus double, of barbellate bristles, with an outer row of narrow paleae **14. Engleria, O. Hoffm.**
 Pappus either of bristles or paleae, not of both 21
21. Pappus of many short distinct paleae, or more or less united into a toothed cup **69. Nestlera, Spreng.**
 Pappus of copious scabrid bristles 22
22. Anthers blunt at the base; style-branches appendaged **21. Aster, Linn.**
 Anthers tailed at the base; style-branches truncate **76. Antithrixia, DC.**
23. Involucral bracts spinescent; leaves at length decurrent **177. Berkheya, Ehrh.**
 Involucral bracts unarmed; the outer expanded into leaf-like appendages **178. Didelta, L'Her.**

24. Receptacle nude, rarely bristly 25
 Receptacle paleate 27
25. Achenes with 3 wings and a cupular apical appendage . **164. Tripteris, Less.**
 Achenes without distinct wings or other appendages 26
26. Corolla of ray florets 3-toothed; anthers entire at the base; style-
 branches deeply cleft **120. Eumorphia, DC.**
 Corolla of ray florets entire; anthers sagittate at the base; style-
 branches undivided or very shortly 2-lobed . **163. Osteospermum, Linn.**
27. Involucral bracts woolly **117. Eriocephalus, Linn.**
 Involucral bracts not woolly 28
28. Involucral bracts in few or many rows, but not distinctly double . 29
 Involucre double **108. Coreopsis, Linn.**
29. Receptacle conical, at length cylindric; ray florets brick-red
102. Zinnia, Linn.
 Receptacle flat or convex, rarely conical, but if so then ray florets not
 brick-red 30
30. Inner involucral bracts scarious, lacerated **120. Eumorphia, DC.**
 Inner involucral bracts not scarious and lacerated 31
31. Scabro-pubescent or hirsute plants **105. Wedelia, Jacq.**
 Glabrous plants **107. Spilanthes, Jacq.**
32. Pappus present 33
 Pappus absent 47
33. Pappus of bristles, sometimes with an outer pappus of paleae . . . 34
 Pappus of paleae, rarely sometimes with an inner pappus of 2 bristles,
 or rarely pappus crown-like of very minute scales or paleae fused
 into a tube 40
34. Pappus double, of paleae and bristles 35
 Pappus of bristles only 36
35. Achenes silky-villous; pappus rough **13. Fresenia, DC.**
 Achenes hirsute; pappus distinctly barbellate . . . **14. Engleria, O. Hoffm.**
36. Anthers sagittate; leaves often 3-4-nate, verticillate or opposite the
 branches **3. Bothriocline, Oliv.**
 Anthers obtuse at the base 37
37. Pappus of a few gland-tipped bristles; achenes glandular
7. Adenostemma, Forst.
 Pappus bristles not gland-tipped; achenes glabrous or hairy . . . 38
38. Climbing shrubs or herbs; involucre of 4 bracts, bracteolate at or
 below the base **10. Mikania, Willd.**
 Herbs or shrubs, not climbing; involucral bracts in few or many
 rows; basal bracteoles absent 39
39. Achenes 5-angled, truncate above, glabrous or hairy on the ribs
9. Eupatorium, Linn.
 Achenes turbinate or more or less compressed, often contracted into
 a neck at the apex **15. Pteronia, Linn.**
40. Pappus of very minute scales, crown-like or fused into a distinct tube 41
 Pappus of distinct paleae *or 3-5 wings* 42
41. Woody shrubs; pappus fused into a distinct tube . . . **119. Oedera, Linn.**
 Herbs; pappus of very minute scales, crown-like . . . **104. Eclipta, Linn.**
42. Bracts in 1-3 rows; anthers obtuse at the base 43
 Bracts in many rows; anthers sagittate at the base 44
43. Bracts connate at the base; achenes glandular; pappus gland-
 tipped **7. Adenostemma, Forst.**
 Bracts not connate; achenes not glandular; pappus lacerated or
 pectinate **8. Ageratum, Linn.**
44. Thistle-like plants; leaves often decurrent; involucral bracts
 spinescent **177. Berkheya, Ehrh.**
 Herbs or shrubs, not thistle-like; involucral bracts not spinescent . 45
45. Receptacle honeycombed, without paleae, but sometimes with
 bristles from the margins of the pits **69. Nestlera, Spreng.**
 Receptacle covered with distinct paleae 46

46. Leaves glabrous or finely canescent; pappus of distinct paleae, or paleae united into a cup **71. Relhania, L'Her.**
 Leaves albo-tomentose above; pappus of the disc florets double; the inner of 2 long bristles **72. Rosenia, Thunb.**
47. Heads unisexual **100. Ambrosia, Linn.**
 Heads bisexual. **48**
48. All the florets pedicelled; the pedicels persistent on the receptacle; corolla-tube winged, produced into an ear-like spur at the base which envelops the ovary **131. Otochlamys, DC.**
 Florets all sessile; receptacle nude or paleate **49**
49. Receptacle nude **50**
 Receptacle covered with paleae **51**
50. Heads solitary and sessile between the leaves . . . **137. Asaemia, Harv.**
 Heads crowded and corymbose at the apices of the branches **138. Gymnopentzia, Benth.**
51. Inner involucre bracts densely woolly **117. Eriocephalus, Linn.**
 Inner involucre bracts not woolly **52**
52. Inner involucre bracts tightly enveloping the outer florets . . . **53**
 Inner involucre bracts free from the florets **54**
53. Fruit armed with hooked bristles . . . **98. Acanthospermum, Schrank**
 Fruits glabrous, without bristles **103. Siegesbeckia, Linn.**
54. Involucre distinctly double **55**
 Involucre bracts more or less in 2 rows **104. Eclipta, Linn.**
55. Bracts of the inner involucre more or less connate at the base; achenes with winged margins **108. Coreopsis, Linn.**
 Bracts of the inner involucre free; achenes not winged **110. Thelesperma, Less.**
56. Rays conspicuous **57**
 Rays absent or inconspicuous, or head discoid with marginal female florets **160**
57. Pappus present (in *Arrowsmithia* the receptacle covered with long caducous bristles which might be mistaken for a pappus) . . . **58**
 Pappus absent **132**
58. Pappus consisting of bristles, rarely double of bristles and paleae, or rays with paleae only; achenes rarely enclosed in deep pits, but if so then outer bracts expanded into leaf-like appendages . . . **59**
 Pappus of all florets of paleae, rarely coroniform at the base and split into ciliate bristles, but then achenes enclosed in deep pits . . . **107**
59. Pappus double, consisting of bristles and paleae **60**
 Pappus of bristles only, or rays with paleae and disc florets with bristles, rarely disc florets with bristles and paleae **67**
60. Receptacle without paleae **61**
 Receptacle covered with paleae **63**
61. Achenes winged; anthers obtuse **14. Engleria, O. Hoffm.**
 Achenes not winged; anthers sagittate **62**
62. Involucre in many rows; pappus of ray florets of scales only; of disc florets of plumose bristles and scales **73. Leyssera, Linn.**
 Involucre sub-2-seriate; pappus of ray and disc florets of paleae and sub-barbellate paleaceous bristles **87. Calostephane, Benth.**
63. Pappus of ray florets of paleae only; of disc florets of paleae and bristles **64**
 Pappus of all the florets of bristles and paleae **66**
64. Pappus bristles plumose; leaves narrow, linear or subulate **73. Leyssera, Linn.**
 Pappus bristles not plumose, rarely of a few sub-plumose bristles; leaves not linear nor subulate **65**
65. Heads solitary, peduncled; anthers obtuse **20. Amellus, Linn.**
 Heads few at the apex of the branches; anthers tailed **91. Philyrophyllum, O. Hoffm.**
66. Heads solitary, peduncled **94. Calliepis, DC.**
 Heads in a lax terminal corymb **95. Anisopappus, Hook. & Arn.**

67. Pappus of ray florets of paleae ; of disc florets of bristles 73. *Leyssera*, *Linn.*
Pappus of all florets of bristles 68
68. Corolla of disc florets 2-lipped 188. *Gerbera*, *Gronov.*
Corolla of disc florets not 2-lipped 69
69. Ray florets bisexual ; disc florets female 186. *Oldenburgia*, *Less.*
Ray florets female, rarely neuter ; disc florets bisexual, fertile or sterile 70
70. Rays neuter 71
Rays female 73
71. Achenes hairy ; outer bracts not expanded and leaf-like 72
Achenes glabrous ; outer bracts expanded and leaf-like 178. *Didelta*, *L'Her.*
72. Leaves obovate-oblong, canescent-villous beneath 85. *Cypselodontia*, *DC.*
Leaves small, with revolute margins, glabrous 174. *Hirpicium*, *Cass.*
73. Pappus absent from the disc florets 155. *Gymnodiscus*, *Less.*
Pappus present in the disc florets, sometimes absent in the ray florets 74
74. Pappus absent from the ray florets, or represented by 1-2 bristles 75
Pappus present in the disc and ray florets 77
75. Inflorescence axillary ; bracts in 1 row ; pappus barbellate 154. *Lasiocoma*, *Bolus*
Heads terminal ; bracts in a few rows (rarely 1-seriate) ; pappus plumose (more rarely barbellate) 76
76. An annual herb ; achenes pilose 17. *Charieis*, *Cass.*
Half-herbaceous or shrubby plants ; achenes glandular-scarid 18. *Gymnostephium*, *Less.*
77. Heads sessile, solitary, generally surrounded by the upper leaves 78
Heads usually solitary and peduncled, if corymbose or paniced then not surrounded by the upper leaves 81
78. Involucral bracts in 1 row, more or less united into a cup 157. *Othonna*, *Cass.*
Involucral bracts in several rows 79
79. Corolla of disc florets 5-toothed ; style-branches truncate at the apex 67. *Amphiglossa*, *DC.*
Corolla of disc florets 5-fid ; style-branches obtuse or acute at the apex 80
80. Glandular-pubescent shrubs ; achenes papillose-puberulous 82. *Homochaete*, *Benth.*
Shrubs with albo-tomentose leaves ; achenes densely silky 144. *Eremothamus*, *O. Hoffm.*
81. Bracts scarious at the apex 81
Bracts sometimes with a scarious margin, but not with a scarious apex 83
82. Disc florets sterile ; achenes slightly pubescent 74. *Macowania*, *Oliv.*
Disc florets fertile ; achenes densely villous 77. *Heterolepis*, *Cass.*
83. Bracts in 1 row, connate 84
Bracts in 2 to many rows, if in 1 row then not connate to form a cup, or pappus in woolly tufts 90
84. A marsh herb, with amplexicaul leaves 114. *Cadiscus*, *E. Mey.*
Herbs or shrubs ; leaves rarely amplexicaul 85
85. Disc florets fertile, rarely some sterile, if all sterile then the leaves amplexicaul 86
Disc florets sterile, if rudimentary ovules present, then branches pallid ; leaves with a decurrent line and woolly in the axils 88
86. Heads with a few bracts at the base of the involucre 151. *Senecio*, *Linn.*
Heads without bracts at the base of the involucre 87
87. Annual herbs, with amplexicaul leaves ; heads laxly paniced 152. *Oligothrix*, *DC.*
Shrubs ; leaves often crowded ; heads solitary 153. *Euryops*, *Cass.*
88. Leaves amplexicaul 152. *Oligothrix*, *DC.*
Leaves not amplexicaul 89

89. Style-branches of disc florets 2-cleft **145. Hertia, Less.**
 Style-branches of disc florets undivided **157. Othonna, Linn.**
90. Pappus aggregated in woolly tufts **156. Ruckeria, DC.**
 Pappus not aggregated in woolly tufts 91
91. Bracts in 1 row, or sub-1 row 92
 Bracts in 2 to many rows 95
92. Heads with a few bracts at the base of the involucre ; achenes terete or angled **151. Senecio, Linn.**
 Heads without bracts at the base of the involucre, but if a few bracts present then the achenes compressed 93
93. Disc florets fertile **153. Euryops, Cass.**
 Disc florets sterile 94
94. Heads solitary or in a short leafy panicle ; achenes oblong, obscurely 5-10-ribbed **145. Hertia, Less.**
 Heads laxly corymbose, very rarely heads solitary, but then leaves not entire ; achenes ovate, compressed, 1-2-ribbed **150. Cineraria, Linn.**
95. Anthers obtuse, if shortly sagittate then heads with a few bracts at the base of the involucre 96
 Anthers sagittate at the base 103
96. Pappus plumose or sub-plumose 97
 Pappus barbellate, scabrid, or smooth, if somewhat plumose then leaves revolute and tomentose beneath 99
97. Achenes densely silky **11. Homochroma, DC.**
 Achenes glabrous or sparsely pilose 98
98. Receptacle nude **19. Mairia, Nees**
 Receptacle covered with paleae **20. Amellus, Linn.**
99. Style-branches of disc florets flattened, obtuse or with a lanceolate appendage, papillose on the outer surface 100
 Style-branches of disc florets truncate at the apex, not papillose on the outer surface 102
100. Ray florets yellow or pale coloured **12. Solidago, Linn.**
 Ray florets blue, violet, or white 101
101. Pappus bristles in 2 to many rows **21. Aster, Linn.**
 Pappus bristles in 1 row **23. Felicia, Cass.**
102. Heads with a few bracts at the base **151. Senecio, Linn.**
 Heads naked at the base **128. Matricaria, Linn.**
103. Woolly or tomentose herbs ; leaves usually near the base of the stem, woolly beneath **147. Alciope, DC.**
 Herbs or shrubs ; leaves not all near the base of the stem 104
104. Ray florets white, blue, or red ; style swollen towards the apex **79. Printzia, Cass.**
 Ray florets yellow, if white then plants herbaceous, if mauve then style not swollen above 105
105. Herbs, glandular-scabrid, pubescent, villous, or tomentose, rarely shrubs **80. Inula, Linn.**
 Shrubs or undershrubs, if herbaceous then leaves with revolute margins and tomentose beneath 106
106. Pappus bristles in 1 row **75. Athrixia, Ker**
 Pappus bristles 20, in 2 rows **83. Minurothamnus, DC.**
107. Herbs with decurrent leaves ; style-branches of disc florets acute at the apex **87. Calostephane, Benth.**
 Herbs or shrubs ; style-branches of disc florets obtuse or truncate, very rarely almost acute 108
108. Outer involucrel bracts expanded into large leaf-like appendages **178. Didelta, L'Her.**
 Involucrel bracts sometimes with scarious margins or sometimes acuminate 109
109. Corolla of disc florets 2-winged, sometimes gibbous at the base 110
 Corolla of disc florets usually terete, never gibbous at the base 111

110. Receptacle covered with paleae or awns . . . 123. *Anthemis*, Linn.
Receptacle nude . . . 130. *Chrysanthemum*, Linn.
111. Pappus double, of short paleae and 2-5 longer scales or bristles . . . 112
Pappus in a single row, if a double row of unequal paleae then the
receptacle deeply pitted and the achenes long-hairy . . . 113
112. Heads peduncled, solitary . . . 94. *Callilepis*, DC
Heads in a lax terminal corymb . . . 95. *Anisopappus*, Hook. & Arn.
113. Involucral bracts united below or high up . . . 114
Involucral bracts free or almost so . . . 118
114. Involucral bracts united at base only, or up to half-way . . . 115
Involucral bracts united high up . . . 116
115. Thistle-like plants with spiny leaves and bracts; receptacle deeply
honeycombed; the pits nearly enclosing the achenes . . . 177. *Berkheya*, Ehrh.
Outer involucral bracts resembling the leaves; pits on the receptacle
very much shorter than the achenes . . . 175. *Berkheyopsis*, O. Hoffm.
116. Involucral bracts spinescent . . . 172. *Gorteria*, Linn.
Involucral bracts often acute, but not spinescent . . . 117
117. Pappus of many paleae in 1 row; heads large or very large, long-
peduncled . . . 173. *Gazania*, Gaertn.
Pappus crown-like, at length splitting into setae; heads small,
shortly peduncled . . . 174. *Hirpicium*, Cass.
118. Achenes with 2 collateral cavities; involucral bracts with mem-
branous apices . . . 119
Achenes without collateral cavities; involucral bracts rarely with
membranous apices . . . 120
119. Achenes villous, or with long hairs from the base . . . 166. *Arctotis*, Linn.
Achenes glabrous . . . 167. *Venidium*, Less.
120. Achenes of disc florets densely woolly . . . 171. *Cryptostemma*, R.Br.
Achenes glabrous, pubescent, or villous, sometimes with a basal
tuft of hairs, but never woolly . . . 121
121. Anthers obtuse at the base . . . 122
Anthers sagittate at the base . . . 125
122. Bracts with membranous apices; ray florets neuter, or inner
bracts scarious at the apex and ray florets female . . . 123
Bracts not membranous at the apex; ray florets female . . . 124
123. Ray florets female . . . 130. *Chrysanthemum*, Linn.
Ray florets neuter . . . 165. *Ursinia*, Gaertn.
124. Leaves variously pinnatisect; receptacle rounded, conical, or elon-
gated, nude; achenes glabrous . . . 128. *Matricaria*, Linn.
Leaves entire or toothed; receptacle flat, glandular-fimbriate;
achenes glandular-hispid . . . 129. *Lepidostephium*, Oliv.
125. Receptacle paleate . . . 126
Receptacle without paleae, but sometimes with bristles, sometimes
honeycombed with the margins of the pits fimbriiferous . . . 128
126. Aromatic undershrubs . . . 97. *Osmites*, Linn.
Non-aromatic herbs, shrubs, or undershrubs . . . 127
127. Corolla of disc florets 5-toothed; style-branches obtuse or truncate
at the apex . . . 71. *Relbania*, L'Her.
Corolla of disc florets divided almost to the base; style-branches
linear-lanceolate . . . 93. *Geigeria*, Griess.
128. Shrubs, or plants woody at the base only; leaves linear . . . 129
Almost acaulescent herbs; leaves radical, cano-tomentose or woolly . . . 131
129. Outer involucral bracts appendaged, different from the inner . . . 93. *Geigeria*, Griess.
Outer involucral bracts similar to the inner, but smaller . . . 130
130. Disc florets fertile; style divided . . . 69. *Nestlera*, Spreng.
Disc florets sterile; style undivided . . . 164. *Tripteris*, Less.
131. Heads sub-sessile between the leaves . . . 168. *Landtia*, Less.
Heads on a scape longer than the leaves . . . 169. *Haplocarpha*, Less.

132. Receptacle paleate or covered with bristles 133
 Receptacle nude 143
133. Leaves spinous-toothed or ciliate ; bracts spinescent, with the outer
 or all spinose-ciliate 176. *Cullumia*, *R.Br.*
 Leaves not spinous-toothed ; bracts rarely spinescent, but if so then
 not spinous-ciliate 134
134. Corolla of disc florets woolly without, or gibbous at the base . . . 135
 Corolla not woolly nor gibbous 136
135. Corolla or ray and disc florets woolly without ; leaves pungent
 78. *Arrowsmithia*, *DC.*
 Corolla of disc florets gibbous at the base ; perennial herbs
 123. *Anthemis*, *Linn.*
136. Involucral bracts, or inner bracts only, connate high up . . . 137
 Involucral bracts free, or connate at the base only 138
137. Inner involucral bracts woolly 117. *Eriocephalus*, *Linn.*
 Involucral bracts not woolly 174. *Hirpicium*, *Cass.*
138. Glandular-pubescent aromatic shrubs 96. *Osmitopsis*, *Cass.*
 Annual or perennial herbs or shrubs, not aromatic nor glandular-
 pubescent 139
139. Anthers obtuse at the base 140
 Anthers sagittate at the base 142
140. Heads corymbose 124. *Achillea*, *Linn.*
 Heads solitary 141
141. Achenes glabrous 109. *Chrysanthellum*, *L.C.Rich.*
 Achenes hairy 118. *Lasiospermum*, *Lag.*
142. Inner involucral bracts scarious at the apex 170. *Arctotheca*, *Wendl.*
 Bracts somewhat spinescent 172. *Gorteria*, *Linn.*
143. Shrubs ; rays neuter ; corolla of disc florets 4-fid 144
 Shrubs or herbs ; rays female ; corolla of disc florets 5-toothed or
 5-fid, very rarely 4-fid and then herbs 145
144. Bracts ciliate ; achenes glandular-papillose 126. *Lidbeckia*, *Berg.*
 Bracts silky ; achenes glabrous 127. *Thaminophyllum*, *Harv.*
145. Heads axillary 154. *Lasiocoma*, *Bolus*
 Heads terminal, solitary, corymbose, or paniced 146
146. Bracts very acute and spinescent ; achenes hairy 172. *Gorteria*, *Linn.*
 Bracts not acute nor spinescent ; achenes hairy, glabrous, or
 glandular-papillose 147
147. Achenes glandular-papillose 125. *Phymaspermum*, *Less.*
 Achenes glabrous or hairy, rarely with a few glandular hairs, but then
 corolla glandular-hairy 148
148. Inner bracts with broadly scarious apices ; achenes with 2 collateral
 cavities 167. *Venidium*, *Less.*
 Inner bracts sometimes with scarious margins, rarely with a scarious
 apex ; achenes without collateral cavities 149
149. Heads corymbose ; leaves in a radicle rosette 155. *Gymnodiscus*, *Less.*
 Heads solitary, or laxly paniced, rarely corymbose, if so then
 leaves pinnatisect 150
150. Shrubs with rigidly mucronate-acute leaves ; disc florets fertile
 70. *Anaglypha*, *DC.*
 Herbs or shrubs ; leaves not rigidly mucronate-acute ; disc florets
 sterile, rarely some fertile and some sterile, if all fertile then leaves
 pinnatisect or style-branches truncate 151
151. Disc florets all fertile ; style-branches truncate 152
 Disc florets all or some sterile ; style-branches with a conical apex,
 or those of the disc florets undivided 154
152. Bracts in a few or many rows 153
 Bracts in 1 row, connate at the base 158. *Gamolepis*, *Less.*
153. Inner involucral bracts not scarious at the apex 128. *Matricaria*, *Linn.*
 Inner involucral bracts scarious at the apex 130. *Chrysanthemum*, *Linn.*

154. Style of disc florets 2-cleft 155
 Style of disc florets undivided (sometimes only in the innermost
 florets), or style shortly 2-lobed 156
155. Involucre sub-1-seriate; achenes hairy 159. *Steiodiscus*, Less.
 Involucre bracts in few to many rows; achenes glabrous 162. *Garuleum*, Cass.
156. Fruits of ray florets different, either in the same head or in different
 heads on the same plant 160. *Oligocarpus*, Less.
 Fruits of ray florets all alike 157
157. Fruits of ray florets with 3 wings and a cupular apical appendage 164. *Tripteris*, Less.
 Fruits of ray florets without distinct wings or other appendages 158
158. Fruits of ray florets 3-angled, usually tubercled; fruit of disc, when
 present, flattened, winged, or with thickened margins 161. *Dimorphotheca*, Moench.
 Fruits of ray florets compressed or sub-terete, rarely 3-angled,
 smooth, or indistinctly ribbed, or transversely rugose; disc
 florets never producing achenes 159
159. Ray florets blue or white; achenes compressed or 3-angled, some-
 times transversely rugose 162. *Garuleum*, Cass.
 Ray florets yellow; achenes hard, sub-terete, sometimes obscurely
 3-10-ribbed 163. *Osteospermum*, Linn.
160. Pappus present 161
 Pappus absent 291
161. Pappus of bristles 162
 Pappus of paleae 259
162. Receptacle covered with paleae, densely setose, fimbriate, or the
 margins of the pits produced into bristles 163
 Receptacle nude, sometimes deeply honeycombed, with the margins
 of the pits membranous and evident 185
163. Receptacle densely setose 164
 Receptacle paleate, fimbriate, or bristly, very rarely pilose, but not
 densely setose 169
164. Filaments glabrous 165
 Filaments papillose or pilose 166
165. Heads homogamous, all the florets bisexual; pappus sub-paleaceous 183. *Silybum*, Gaertn.
 Heads heterogamous, with marginal neuter florets; pappus serrate,
 barbellate, or plumose 184. *Centaurea*, Linn.
166. Pappus in 2 rows of 10 each; the outer 10 somewhat long, rigid;
 the inner small, slender, fimbriate 185. *Cnicus*, Gaertn.
 Pappus in many rows, plumose or serrulate 167
167. Pappus plumose 168
 Pappus serrulate 180. *Carduus*, Linn.
168. Receptacle fleshy 182. *Cynara*, Linn.
 Receptacle not fleshy 181. *Cirsium*, Scop.
169. Style-branches of the disc florets undivided 170
 Style-branches of the disc florets 2-cleft, subulate, flattened, acute
 or truncate 171
170. Bracts woolly; anthers sagittate 49. *Petalacte*, D. Don.
 Bracts not woolly; anthers obtuse 99. *Parthenium*, Linn.
171. Style-branches truncate or obtuse at the apex 172
 Style-branches subulate, or flattened and acute 180
172. Pappus plumose or barbellate 173
 Pappus sometimes rough, but not plumose nor barbellate 175
173. Disc florets all sterile 43. *Ifloga*, Cass.
 Disc florets fertile, or the innermost only sterile 174
174. Pappus plumose from the base 53. *Helipterum*, DC.
 Pappus never plumose to the base 56. *Helichrysum*, Gaertn.
175. Bracts in 1-2 rows 151. *Senecio*, Linn.
 Bracts in many rows 176

176. Anthers sagittate at the base 177
 Anthers obtuse at the base 122. *Athanasia*, Linn.
177. Achenes hairy 66. *Lachnospermum*, Willd.
 Achenes glabrous or minutely papillose 178
178. Ericoid shrubs, with small sessile leaves 65. *Metalasia*, R.Br.
 Shrubs with petioled or flat leaves, sometimes leaves with revolute
 margins 179
179. Heads in dense cymes, aggregated in head-like groups, or the cymes
 often large and paniced 46. *Achyrocline*, Linn.
 Heads corymbose or paniced 48. *Cassinia*, R.Br.
180. Pappus plumose 43. *Ifloga*, Cass.
 Pappus sometimes rough, but not plumose 181
181. Anthers sagittate at the base 182
 Anthers obtuse at the base, if minutely sagittate then the bracts sub-
 1-seriate 184
182. Pappus double; the outer of many very short fimbriate paleae; the
 inner of 5-6 fine long bristles 41. *Porphyrostemma*, Benth.
 Pappus in 2 to many rows, similar, or sometimes the outer shorter
 and almost scale-like 183
183. Rigid plants, with pungent leaves 4. *Hoplophyllum*, DC.
 Leaves not pungent 5. *Vernonia*, Schreb.
184. Corolla of disc florets 2-fid 24. *Microglossa*, DC.
 Corolla of disc florets 5-fid 185
185. Florets all bisexual, if a few marginal female florets present then the
 style-branches of the disc florets produced into a long subulate
 hairy appendage 186
 Heads with 2 to many rows of female florets with filiform corollas 187
186. Involucral bracts in several rows, often chaffy with membranous
 glabrous or ciliate margins; style-branches flattened 15. *Pteronia*, Linn.
 Involucral bracts sub-1-seriate; style-branches with long subulate
 hairy appendages 149. *Gynura*, Cass.
187. Corolla of the marginal florets strap-shaped or thread-like, but
 shorter than the styles 27. *Conyza*, Linn.
 Corolla of the marginal florets strap-shaped, but longer than the
 styles 188
188. Marginal florets yellow 26. *Nidorella*, Cass.
 Marginal florets red or white 22. *Erigeron*, Linn.
189. Large dioecious shrubs, with unisexual florets 32. *Brachylæna*, R.Br.
 Florets all bisexual, or female and bisexual and male on the same
 head; very rarely plants monoecious and then with ericoid leaves 190
190. Pappus double consisting of bristles and scales, or of 2 rows (10 + 5)
 of unequal bristles 191
 Pappus of bristles only 196
191. Anthers blunt at the base 192
 Anthers sagittate at the base 193
192. Achenes silky villous; pappus rough 13. *Fresenia*, DC.
 Achenes hirsute; pappus distinctly barbellate 14. *Engleria*, O. Hoffm.
193. Heads homogamous; all the florets bisexual 194
 Heads heterogamous, with 1-2 rows of marginal female flowers 90. *Pulicaria*, Gaertn.
194. Style-branches subulate, bristly 5. *Vernonia*, Schreb.
 Style-branches flattened, obtuse 195
195. A glabrous shrub; outer pappus of 10 short bristles; inner pappus of
 5 elongated bristles 88. *Anisothrix*, O. Hoffm.
 Pubescent herbs; outer pappus of narrow paleae; inner pappus of
 copious barbellate or plumose bristles 89. *Pegolettia*, Cass.
196. Style of male or bisexual florets undivided or very shortly 2-fid 197
 Style of male or bisexual florets deeply 2-cleft 204

197. Heads with the marginal female florets without a pappus 198
 Heads with bisexual florets only, or with marginal female florets
 with a pappus 199
198. Erect or diffuse herbs; heads in a cymose-corymb, or rarely sessile on
 the branches 40. *Epaltes*, *Cass.*
 A shrub, with ericoid leaves; heads aggregated at the ends of the
 branches 50. *Petalactella*, *N.E.Br.*
199. Pappus plumose 200
 Pappus not plumose 201
200. Ray florets bisexual; tails of anthers not barbed 186. *Oldenburgia*, *Less.*
 Ray florets neuter; tails of anthers barbed 187. *Dicoma*, *Cass.*
201. Bracts in 1 row, connate 157. *Othonna*, *Linn.*
 Bracts in 3 to many rows, not connate 202
202. A rigid shrub; leaves minute, imbricated on lateral branchlets to
 form tubercle-like swellings 51. *Phænocomia*, *D. Don.*
 Shrubs, sometimes with ericoid leaves 203
203. Leaves ericoid; heads aggregated at the ends of the branches
 50. *Petalactella*, *N.E.Br.*
 Leaves sometimes with revolute margins; heads in cymose corymbs
 at the apices of the branches 52. *Anaxeton*, *Cass.*
204. Heads homogamous, with bisexual florets only 205
 Heads heterogamous, with central bisexual or male florets, and
 marginal female florets 227
205. Bracts in 1 row or sub-1-seriate 206
 Bracts in few to many rows 208
206. Style-branches produced into long subulate hairy appendages 207
 Style-branches flattened, truncate or obtuse 151. *Senecio*, *Linn.*
207. Bracts keel-crested on the back; leaves somewhat fleshy
 148. *Lopholæna*, *DC.*
 Bracts not keel-crested 149. *Gynura*, *Cass.*
208. Anther-tails barbed; involueral bracts spinous 187. *Dicoma*, *Cass.*
 Anthers blunt or tailed, but tails never barbed; involueral bracts
 very rarely spinous, but then leaves pungent 209
209. Style-branches subulate, not truncate at the apex 210
 Style-branches flattened, truncate or obtuse 212
210. Rigid shrubs, with pungent leaves and spinous-mucronate involueral
 bracts 4. *Hoplophyllum*, *DC.*
 Herbs or shrubs; leaves not pungent; involueral bracts not spinous-
 mucronate, sometimes very acuminate 211
211. Pappus rigidly plumose 2. *Erlangea*, *Sch. Bip.*
 Pappus serrated, but not plumose 5. *Vernonia*, *Schreb.*
212. Heads with 1 bisexual floret 60. *Stoebe*, *Linn.*
 Heads with more than 1 bisexual floret, if only one then heads in
 cymes arranged in a corymbose panicle 213
213. Pappus plumose 214
 Pappus not plumose 218
214. Style-branches flattened, obtuse; anthers blunt 9. *Eupatorium*, *Linn.*
 Style-branches truncate or sub-capitate at the apex; anthers
 sagittate, if very minutely sagittate then ericoid shrubs with
 solitary heads 215
215. Pappus feathery at the tip only 56. *Helichrysum*, *Gaertn.*
 Pappus feathery from the base 216
216. Ericoid shrubs 217
 Not ericoid shrubs; anthers distinctly sagittate 53. *Helipterum*, *DC.*
217. Heads in glomerules at the apex of the branches, or axillary and sub-
 fascicled forming spikes 63. *Elytropappus*, *Cass.*
 Heads solitary at the apex of the branches or in the upper leaf axils
 64. *Pterothrix*, *DC.*

218. Heads clustered ; the clusters surrounded by woolly leaves ; pappus beaded **54. Eriosphæra**, *Less.*
 Heads solitary, corymbose, or paniced, rarely clustered, but if so then the clusters not surrounded by woolly leaves ; pappus not beaded 219
219. Ericoid shrubs ; heads crowded at the apex of the branchlets, sessile or sub-umbellate, rarely solitary 220
 Herbs or shrubs, not ericoid ; heads solitary, corymbose, more rarely paniced 221
220. Anthers tailed at the base **65. Metalasia**, *R.Br.*
 Anthers blunt at the base **29. Chrysocoma**, *Linn.*
221. Anthers entire at the base 222
 Anthers sagittate at the base 224
222. Inner involueral bracts membranous at the apex **30. Heteromma**, *Benth.*
 Bracts sometimes with scarious margins, but not membrane-tipped. 223
223. Bracts not scarious on the margins ; achenes 5-angled ; pappus of rigid bristles **9. Eupatorium**, *Linn.*
 Bracts with scarious margins ; achenes compressed ; pappus of slender bristles **29. Chrysocoma**, *Linn.*
224. Tomentose or woolly plants 225
 Glabrous or sparingly hairy plants 226
225. Achenes terete, 8-10-ribbed or 5-angled, glabrous or shortly pilose
 **55. Stenocline**, *DC.*
 Achenes ovate, villous **58. Pachyrhynchus**, *DC.*
226. Glandular-puberulous or villous perennial herbs, with the upper leaves cordate-amplexicaul **81. Bojeria**, *DC.*
 Glabrous or sparingly hairy shrubs ; leaves not amplexicaul
 **84. Iphiona**, *Cass.*
227. Pappus plumose 228
 Pappus smooth, rough, or serrulate, not plumose, rarely minutely tufted at the apex only 233
228. Involueral bracts spinescent **187. Dicoma**, *Cass.*
 Involueral bracts not spinescent 229
229. Heads 1-2-flowered ; leaves ericoid and twisted . **62. Disparago**, *Gaertn.*
 Heads more than 2-flowered, very rarely 2-flowered ; leaves rarely small and ericoid 230
230. Densely woolly annual herbs ; corolla of disc florets 3-toothed ; heads crowded into a sub-glomerate cyme . . **45. Lasiopogon**, *Cass.*
 Rigid shrubs or perennial herbs, often tomentose or woolly ; corolla of disc florets 5-toothed or 5-fid ; heads solitary, corymbose, or paniced 231
231. Pappus feathery at the apex only **56. Helichrysum**, *Gaertn.*
 Pappus feathery from the base 232
232. Rigid shrubs ; leaves small, tomentose beneath ; achenes glabrous
 **67. Amphiglossa**, *DC.*
 Annual or perennial herbs, rarely shrubs, often cano-tomentose, or sub-woolly ; achenes papillose or silky-villous . . **53. Helipterum**, *DC.*
233. Woolly or cano-tomentose herbs, sometimes woody at the base, rarely shrubs ; outer bracts woolly on the back ; very rarely glabrous ; inflorescence cymose 234
 Herbs or shrubs, not woolly-tomentose ; bracts glabrous ; heads various, but not cymose 239
234. Marginal female florets without a pappus ; pappus of disc florets of 2-6 bristles **44. Amphidoxa**, *DC.*
 Pappus present on the marginal female florets 235
235. Heads in dense terminal woolly cymes ; pappus in many rows
 **57. Leontonyx**, *Cass.*
 Heads not enveloped in woolly hairs ; but if so then pappus in 1 row 236
236. Erect shrubs **46. Achyrocline**, *Less.*
 Herbs, sometimes woody at the base 237

237. Involucral bracts herbaceous 80. *Inula*, *Linn.*
 Involucral bracts wholly scarious, or scarious at the apex 238
238. Heads in glomerate cymes, rarely solitary; achenes oblong or obovate 47. *Gnaphalium*, *Linn.*
 Cymes in corymbose panicles; achenes 8-10-ribbed or 5-angled 55. *Stenocline*, *DC.*
239. Moss-like plants forming cushion-shaped growths and with ericoid leaves, or marsh herbs with amplexicaul leaves 240
 Erect or prostrate herbs or shrubs, not moss-like, if marsh plants then leaves not amplexicaul 241
240. Moss-like plants, with ericoid leaves 68. *Bryomorpha*, *Harv.*
 Marsh herbs with amplexicaul leaves 114. *Cadiscus*, *E. Mey.*
241. Style-branches truncate or rounded at the apex 242
 Style-branches with a lanceolate appendage, or subulate, not truncate 246
242. Pappus absent from the marginal female florets 146. *Stilpnogyne*, *DC.*
 Pappus present on the marginal female florets 243
243. Involucre with a few bracts at the base 151. *Senecio*, *Linn.*
 Involucre without bracts at the base 244
244. Involucral bracts in a few rows; style-branches broadened above, obtuse at the apex 81. *Bojeria*, *DC.*
 Involucral bracts in 1 row; style-branches truncate and penicillate at the apex 245
245. Heads solitary at the apex of the branches, or in a short leafy panicle; achenes 5-10-ribbed 145. *Hertia*, *Less.*
 Heads laxly corymbose; achenes compressed 150. *Cineraria*, *Linn.*
246. Heads solitary, sessile, surrounded by the upper leaves 144. *Eremothamnus*, *O. Hoffm.*
 Heads solitary, corymbose, or paniced, not surrounded by the upper leaves 247
247. Bracts in 1 row, sometimes connate at the base 149. *Gynura*, *Cass.*
 Bracts in 2 to many rows 248
248. Pappus absent in the marginal female florets; in the disc florets of 1-3 minute bristles 16. *Dichrocephalus*, *L'Her.*
 Pappus present in the marginal florets 249
249. Pappus of 3 caducous bristles 39. *Nicolasia*, *Sp. Moore*
 Pappus of many bristles 250
250. Style-branches with a lanceolate appendage; anthers obtuse at the base 251
 Style-branches subulate; anthers sagittate at the base, rarely almost blunt 256
251. Corolla of disc florets 2-fid 24. *Microglossa*, *DC.*
 Corolla of disc florets 5-fid or 5-toothed, rarely 4-toothed 256
252. Heads solitary; marginal florets in 1 row 28. *Nolletia*, *Cass.*
 Heads corymbose; corymbs sometimes paniced; rarely heads solitary, if so then bracts sub-2-seriate; marginal florets in 2 to many rows 253
253. Style, or at least the style-branches, of the marginal florets exceeding the corolla, if the corolla reaches the junction of the style-branches then the involucral bracts in many rows 254
 Style and style-branches of the marginal florets shorter than the corolla; involucral bracts in 2-3 rows 255
254. Achenes of ray florets 3-5-angled 25. *Psiladia*, *Jacq.*
 Achenes compressed, not angled 27. *Conyza*, *Linn.*
255. Marginal florets yellow 26. *Nidorella*, *Cass.*
 Marginal florets white or red 22. *Erigeron*, *Linn.*
256. Marginal florets in 1 row, 4-fid 37. *Pechuel-Loeschea*, *O. Hoffm.*
 Marginal florets in many rows, minutely toothed 257
257. Corolla of disc florets 5-fid; achenes 4-5-angled 36. *Pluchea*, *Cass.*
 Corolla of disc florets 5-toothed; achenes with prominent ribs or almost smooth 258

258. Anthers distinctly sagittate; achenes with prominent ribs
 34. *Blumea*, DC.
 Anthers scarcely sagittate; achenes not ribbed . . . 35. *Laggera*, Sch. Bip.
259. Receptacle covered with paleae, fimbriate, pilose, or densely setose . . . 260
 Receptacle nude . . . 276
260. Style of the disc florets undivided; receptacle not deeply pitted
 nor achenes sunk . . . 99. *Parthenium*, Linn.
 Style of disc florets divided, sometimes undivided in the sterile
 florets, but then receptacle deeply pitted and the achenes sunk . . . 261
261. Receptacle fleshy, densely setose . . . 184. *Centaurea*, Linn.
 Receptacle not fleshy, pilose, fimbriate, nor paleate, very rarely
 densely setose . . . 262
262. Style-branches subulate . . . 263
 Style-branches linear, obtuse or truncate . . . 267
263. Sub-caulescent plants, with the heads more or less massed in the
 centre of a rosette of leaves . . . 179. *Platycarpha*, Less.
 Erect shrubs or herbs . . . 264
264. Rigid shrubs, with spinous bracts and pungent leaves
 4. *Hoplophyllum*, DC.
 Bracts and leaves not spinous nor pungent . . . 265
265. Anthers sagittate at the base . . . 5. *Vernonia*, Schreb.
 Anthers obtuse at the base . . . 266
266. Style-branches exserted, cylindric, obtuse . . . 8. *Ageratum*, Linn.
 Style-branches flattened, truncate . . . 130. *Chrysanthemum*, Linn.
267. Pappus double, of bristles and paleae . . . 41. *Porphyrostemma*, Benth.
 Pappus of paleae; paleae all alike, sometimes the alternate paleae
 awned . . . 268
268. Style-branches truncate . . . 269
 Style-branches obtuse, not truncate . . . 274
269. Anthers obtuse . . . 270
 Anthers sagittate . . . 272
270. Corolla of disc florets 2 winged . . . 123. *Anthemis*, Linn.
 Corolla of disc florets not winged . . . 271
271. Receptacle covered with paleae . . . 122. *Athanasia*, Linn.
 Receptacle shortly fimbriate . . . 140. *Pentzia*, Thunb.
272. Receptacle honeycombed, with the margins of the pits here and
 there produced into bristles or setae . . . 69. *Nestlera*, Spreng.
 Receptacle covered with distinct paleae . . . 273
273. Corolla of disc florets with a cylindric scarcely widened 5-toothed
 limb . . . 71. *Relbania*, L'Her.
 Corolla of disc florets with a slender tube and a widened or cam-
 panulate 5-fid limb . . . 122. *Athanasia*, Linn.
274. Bracts spinescent; honeycombed pits on receptacle nearly enclosing
 the achenes . . . 177. *Berkheya*, Ehrh.
 Bracts not spinescent; receptacle setose or with paleae clasping the
 florets . . . 275
275. Receptacle paleate . . . 92. *Eenia*, Hiern & Sp. Moore
 Receptacle setose . . . 93. *Geigeria*, Griess.
276. Pappus absent from the marginal female florets, in the disc florets of
 1-2 long scales palmately fimbriate at the apex . . . 38. *Denekia*, Thunb.
 Marginal female florets, when present, with a pappus . . . 277
277. Pappus double, of paleae and bristles . . . 278
 Pappus of paleae only, sometimes crown-like . . . 281
278. Anthers blunt at the base . . . 279
 Anthers sagittate at the base . . . 280
279. Heads solitary, terminal; involucrel bracts bearing a dorsal row of
 1-3 glands . . . 13. *Fresenia*, DC.
 Heads in cymes, if solitary then axillary; achenes narrowly winged
 14. *Engleria*, O. Hoffm.

280. Heads homogamous, all the florets bisexual **89. Pegolettia, Cass.**
 Heads heterogamous, with 1-2 rows of marginal female florets **90. Pulicaria, Gaertn.**
281. Heads 1-flowered, surrounded by 2 bracts, the one clasping the other **6. Corymbium, Linn.**
 Bracts more than 2, in 1 to many rows 282
282. Bracts in 1 row, densely villous without **121. Phaeocephalus, Sp. Moore**
 Bracts in 2 to many rows, very rarely in 1 row, not villous 283
283. Style-branches subulate 284
 Style-branches flattened, obtuse, truncate, or with a lanceolate
 appendage 286
284. Anthers sagittate at the base 285
 Anthers obtuse at the base, with a terminal appendage **8. Ageratum, Linn.**
285. Bracts spinescent; leaves pungent **4. Hoplophyllum, DC.**
 Leaves not pungent **5. Vernonia, Schreb.**
286. Shrubs; anthers obtuse at the base 287
 Herbs or shrubs; anthers sagittate at the base, very rarely obtuse,
 but then an annual herb with involucrel bracts in 1 row 289
287. Style-branches with a lanceolate obtuse appendage; pappus scales
 hyaline, united at the base, partly free above **31. Pentheriella, O. Hoffm. & Musch.**
 Style-branches truncate; pappus of short paleae united into a cup, or
 of about 8 scales about half as long as the corolla-tube 288
288. Pappus of 8 well-developed scales, half as long as the corolla **142. Marasmodes, DC.**
 Pappus crown-like, ear-like, or 0 **140. Pentzia, Thunb.**
289. A dwarf annual herb; bracts (5-8) in 1 row; heads small, on long
 slender peduncles **145. Schkuhria, Roth.**
 Erect or prostrate herbs or shrubs, or sub-scandent shrubs; bracts
 in many rows; heads shortly peduncled, or sessile, or arranged in
 panicles 290
290. Leaves entire; heads terminal, or sessile in the forks of the branches,
 or very shortly peduncled **69. Nestlera, Spreng.**
 Leaves deeply incised-toothed; heads paniced. **86. Anisochaeta, DC.**
291. Flowers unisexual; plants monoecious or dioecious 292
 Disc florets bisexual 294
292. Dioecious trees or shrubs; achenes woolly **33. Tarchonanthus, Linn.**
 Monoecious annual or perennial herbs, sometimes sub-woody 293
293. Male heads in terminal spikes or racemes; fruits (really involucre
 of female head) beaked, tuberculate or with prickles **100. Ambrosia, Linn.**
 Male heads solitary or clustered at the apex of the branches; fruits
 (really involucre of female head) 2-beaked, covered with hooked
 spines **101. Xanthium, Linn.**
294. Receptacle nude 295
 Receptacle paleate or setose 314
295. Style-branches subulate, lanceolate, undivided or shortly bifid, not
 truncate at the apex 296
 Style-branches truncate or rounded at the apex 299
296. Heads paniced, very rarely solitary; anthers obtuse at the base **16. Dichrocephala, L' Her.**
 Heads corymbose or clustered; anthers sagittate at the base 297
297. Heads homogamous; all the florets bisexual **1. Ethulia, Linn.**
 Heads heterogamous, with marginal female florets 298
298. Erect villous herbs; heads in solitary glomerules at the apices of the
 branches **42. Sphaeranthus, Linn.**
 Erect or diffuse herbs; heads in a cymose-corymb, or sessile on the
 branches **40. Epaltes, Cass.**
299. Corolla of disc florets with 4 lobes, rarely of 5 lobes, but if so then the
 inner involucrel bracts scarious at the apex 300
 Corolla of disc florets with 5 lobes 303

300. Peduncle inflated at the apex 133. *Cenia*, *Juss.*
 Peduncle not inflated at the apex 301
301. Heads solitary ; bracts in 2 rows 132. *Cotula*, *Linn.*
 Heads corymbose, rarely solitary ; bracts in many rows 302
302. Leaves simple ; corolla-tube of disc florets flattened . 139. *Peyrousea*, *DC.*
 Leaves divided or fan-shaped ; corolla-tube of disc florets not flattened 134. *Schistostephium*, *Less.*
303. Ericoid shrubs ; heads 1-2-flowered 304
 Herbs or shrubs, not ericoid ; heads many-flowered 305
304. Florets all bisexual and fertile 61. *Perotriche*, *Cass.*
 Florets partly bisexual, partly female 62. *Disparago*, *Gaertn.*
305. Woolly or cano-tomentose herbs ; heads in clusters 306
 Herbs or shrubs, sometimes silky-villous ; heads solitary, corymbose, or paniced 307
306. Outer bracts woolly ; marginal florets female 44. *Amphidoxa*, *DC.*
 Bracts coloured or petaloid ; all the florets bisexual 59. *Humea*, *Sm.*
307. Upper leaves amplexicaul ; anthers sagittate at the base 81. *Bojeria*, *DC.*
 Leaves not amplexicaul ; anthers obtuse at the base 308
308. Bracts in 1 row, connate at the base ; leaves mostly radical on long petioles 146. *Stilpnogyne*, *DC.*
 Bracts in more than 1 row ; leaves not radical and long-petioled 309
309. Aromatic herbs or undershrubs 310
 Shrubs or herbs, not aromatic 311
310. Heads paniced, rarely solitary 136. *Artemesia*, *Linn.*
 Heads corymbose 135. *Hippia*, *Linn.*
311. Herbaceous plants 130. *Chrysanthemum*, *Linn.*
 Woody plants 312
312. Marginal florets female ; corolla pubescent or glandular-pubescent 143. *Brachymeris*, *DC.*
 Florets all bisexual 313
313. Leaves toothed, lobed, or much divided ; all the florets fertile 140. *Pentzia*, *Thunb.*
 Leaves entire ; the inner florets sterile 141. *Stilpnophytum*, *Less.*
314. Receptacle setose ; marginal florets neuter ; anthers sagittate at the base 184. *Centaurea*, *Linn.*
 Receptacle paleate ; marginal florets, when present, neuter ; anthers blunt at the base, rarely sagittate, but if so then with a few plumose bristles on the disc florets but none on the marginal florets 315
315. Anthers sagittate at the base 43. *Ifloga*, *Cass.*
 Anthers blunt at the base 316
316. Corolla of disc florets 4-lobed 134. *Schistostephium*, *Less.*
 Corolla of disc florets 5-toothed or -lobed 317
317. Corolla of disc florets 2-winged and gibbous at the base 123. *Anthemis*, *Linn.*
 Corolla of disc florets not winged nor gibbous 318
318. Inner involucrel bracts woolly and connate into a toothed cup 117. *Eriocephalus*, *Linn.*
 Inner involucrel bracts not woolly nor connate 319
319. Heads homogamous ; florets bisexual 122. *Athanasia*, *Linn.*
 Heads heterogamous, with marginal female florets 320
320. Heads paniced or corymbose ; style of disc florets undivided 99. *Parthenium*, *Linn.*
 Heads solitary ; style of disc florets 2-cleft 118. *Lasiospermum*, *Lag.*
321. Pappus of short paleae 189. *Cichorium*, *Linn.*
 Pappus of bristles 322
322. Pappus bristles plumose 323
 Pappus bristles not plumose 325
323. Bracts in many rows ; receptacle paleate 190. *Hypochaeris*, *Linn.*
 Bracts in 1 row ; receptacle without paleae 324

324. Pubescent or hispid herbs ; leaves divided . . . 191. *Urospermum*, Scop.
 Glabrous herbs ; leaves entire 192. *Tragopogon*, Linn.
 325. Achenes beaked or constricted at the apex 326
 Achenes without a beak 327
 326. Achenes 3-5-ribbed 195. *Lactuca*, Linn.
 Achenes 10-20-ribbed 196. *Crepis*, Linn.
 327. Pappus in 1-2 rows, persistent 197. *Hieracium*, Linn.
 Pappus in many rows, deciduous with the basal annulus 328
 328. Achenes prominently 4-5-ribbed 193. *Launaea*, Cass.
 Achenes 10-20-ribbed 194. *Sonchus*, Linn.

8734

1. ETHULIA, Linn.

Heads many-flowered, homogamous. *Involucre* more or less campanulate ; bracts herbaceous, in many series, imbricate, acute. *Receptacle* flat, naked. *Corolla-tube* slender ; limb bell-shaped ; lobes 5, lanceolate. *Anthers* sagittate at the base. *Style* shortly exserted ; style-branches subulate, bristly. *Achenes* 4-5-ribbed, with the ribs angled, glabrous, glandular between the ribs, truncate and 4-5-angled above. *Pappus* an entire thickened marginal rim.

Erect branching leafy herbs ; leaves alternate, entire or serrated, pellucid-dotted ; flower-heads small, in a much-branched corymb ; flowers red or purple.

Species about 5, widely dispersed ; 1 species recorded from South Africa as a weed.

8740

2. ERLANGEA, Sch. Bip.

Heads homogamous. *Involucre* broadly campanulate ; bracts in many series, imbricate, dry, sub-herbaceous at the apex, acute ; the outer gradually smaller. *Receptacle* flat, nude. *Corolla-tube* slender ; limb narrowly bell-shaped ; lobes 5, narrow. *Anthers* sagittate at the base. *Style-branches* subulate, bristly. *Achenes* (immature) turbinate, 4-5-angled ? . *Pappus* bristles few (5 ?), rigidly plumose, caducous.

Erect slender herbs ; leaves alternate, narrow, entire ; flower-heads small pedunculate, few, grouped in a lax corymb.

An African genus of about 44 species ; 1 species found in Bechuanaland and 1 in S. W. Africa.

8746

3. BOTHRIOCLINE, Oliv.

Heads homogamous. *Involucre* campanulate ; bracts in many series, somewhat herbaceous, with scarious margins, or the inner dry ; the outer gradually smaller. *Receptacle* flat, honeycombed. *Corolla-tube* slender ; lobes 5. *Anthers* sagittate at the base, with an obtuse apical appendage. *Style-branches* subulate, bristly. *Achenes* (immature) obovoid or turbinate, 4-5-ribbed, rounded at the apex, glabrous. *Pappus* bristles few, caducous.

An erect branching herb ; leaves 3-4-nate, verticillate, or opposite the branches, shortly petioled, toothed ; heads medium-sized, grouped in a corymb.

An African genus of 13 species ; 1 species found in the Transvaal.

8749

4. HOPILOPHYLLUM, DC.

Heads homogamous, 5-6-flowered. *Involucre* ovate-oblong in outline ; bracts in many series, closely imbricate, broad, obtuse, spinous-mucronate, scarious or horny ; the outer gradually smaller. *Receptacle* flat, shortly fimbriate. *Corolla-tube* slender ; lobes 5, long, linear. *Anthers* sagittate at the base, with a long acuminate apical appendage. *Style-branches* subulate, bristly. *Achenes* sub-3-angled, densely hairy, slightly contracted under the pappus. *Pappus* in many rows, persistent, scarious ; the outer bristle-shaped ; the inner subulate, acuminate.

Rigid shrubs; leaves pungent, subulate or linear; heads sessile, axillary or terminal.

Endemic; species 2, found in the central and north-western districts.

8751

5. VERNONIA, Schreb.

(Including *Dolosanthus*, Klatt)

Heads homogamous, few- or many-flowered. *Involucre* various in shape; bracts in many series, imbricate, obtuse or acute; the inner longer than the outer. *Receptacle* naked, honeycombed or fimbriate. *Corolla-tube* slender; lobes 5, long, lanceolate. *Anthers* sagittate at the base, with an obtuse or acuminate apical appendage, or appendage scarcely developed. *Style-branches* subulate, bristly. *Achenes* linear or prismatic, glabrous, pubescent, or silky-villous, striate or ribbed. *Pappus* in 2 series; the inner of many long serrated bristles; the outer of very narrow short scales; rarely both series nearly alike and sub-equal, or the outer series of a few bristles.

Herbs, shrubs, climbers, rarely trees; leaves alternate, petioled or sessile, often gland-dotted; heads solitary, or grouped in a corymb or spike; flowers usually purple or white.

Species about 960, found in America, tropical Africa, and Asia; 39 species in South Africa, extending from the Transvaal and Natal to Riversdale; also extend into S.W. Africa.

8764

6. CORYMBIUM, Linn.

Heads 1-flowered. *Involucre* cylindric; bracts 2, opposite, one clasping the other, with 2-3 very small bracts at the base. *Receptacle* small. *Corolla-tube* slender; lobes 5, long. *Anthers* blunt at the base, with an obtuse apical appendage. *Style-branches* subulate, bristly. *Achenes* narrowed to the base, densely clothed with long straight silky hairs. *Pappus* short, crown-like, irregularly cleft or fimbriate.

Herbaceous nearly stemless plants; rootstock thick, clothed with long soft silky hairs; leaves radical, linear, parallel-veined, rigid; heads grouped in a lax or dense corymb; peduncle almost naked.

Endemic; species 10, found mostly in the south-western districts, but extend eastwards as far as the Uitenhage and Albany districts.

8785

7. ADENOSTEMMA, Forst.

Heads homogamous. *Involucre* campanulate, shorter than the flowers; bracts in a single or double row, connate at the base, reflexed after flowering. *Receptacle* flat, naked. *Corolla-tube* short, tubular; lobes 5, tooth-like. *Anthers* obtuse at the base, without an apical appendage. *Style-branches* much exerted, linear, dilated above, coloured. *Achenes* oblong, 5-ribbed, glandular. *Pappus* of 3-5 short rigid spreading gland-tipped bristles.

Herbs, glandular-pilose or glabrescent; leaves opposite, petioled, toothed or sub-entire, often 3-nerved; heads peduncled, medium-sized or small, grouped in a panicle.

Species about 33, found in the tropical and sub-tropical regions of both hemispheres; 3 species in South Africa, found in the Transvaal, Zululand, Natal, the Transkei, and Komgha.

8795

8. AGERATUM, Linn.

Heads homogamous. *Involucre* campanulate; bracts in 2-3-series, lanceolate, acuminate, equalling the disc. *Receptacle* flat, scarcely convex, naked or with caducous paleae between the flowers. *Corolla-tube* short; lobes 5, short. *Anthers* obtuse at the base, with a terminal appendage.

Style-branches exerted, cylindric, obtuse. *Achenes* 5-angled, narrowed, with a callus at the base. *Pappus* of 5-20 scales, free or united into a cup, acute or obtuse, lacerated or pectinate.

Erect branched herbs or shrubs; leaves opposite, or the upper alternate; heads medium-sized or small, grouped in a dense corymb, rarely in a lax panicle.

Species about 32, natives of tropical and sub-tropical America; one species found as a weed in the Transvaal, Natal, and Pondoland.

8816

9. EUPATORIUM, Linn.

Heads homogamous, many- (rarely 1-4-) flowered. *Involucre* various in shape; bracts few- or many-seriate; the outer gradually smaller. *Receptacle* flat, convex, or conical. *Corolla-tube* slender, shortly 5-lobed or -toothed. *Anthers* obtuse at the base, appendiculate. *Style-branches* elongate, obtuse, often flattened or thickened above. *Achenes* 5-angled, truncate above, glabrous or hairy on the ribs. *Pappus* of many rigid bristles, often scabrid, rarely feathered.

Herbs, shrubs, or bushes; leaves opposite, rarely alternate, entire, toothed, or rarely dissected; heads large, medium-sized, or small, often grouped in a corymb, rarely in a lax panicle, or solitary on a long peduncle.

Species described over 800, dispersed in the warm and temperate regions of the world; 1 species recorded from the northern Transvaal.

8818

10. MIKANIA, Willd.

Heads homogamous, 4-flowered. *Involucre* oblong in outline; bracts 4, bractcolate at or below the base. *Receptacle* small, naked. *Corolla-tube* short; limb campanulate, 5-cleft. *Anthers* obtuse at the base, appendiculate. *Style-branches* elongate, acute. *Achenes* 5-angled, truncate above. *Pappus* bristles many, 1-2-seriate, often connate at the base.

Climbing shrubs or herbs; leaves opposite, often petioled, often cordate or sagittate at the base; heads small, grouped in a spike, raceme, or corymb; the racemes or corymbs often panicle.

Species about 150, found in the warmer parts of America, Africa, and Asia; 2 species in South Africa, found in the Transvaal, Natal, the Transkei, and as far as the Uitenhage district.

8839

11. HOMOCHROMA, DC.

Heads heterogamous, radiate. *Involucre* broadly campanulate; bracts in a few series, narrow, acute, herbaceous, with the margins sub-scarious; the outer smaller. *Receptacle* flat, nude. *Ray florets* yellow, 1-seriate, female and fertile. *Disc florets* bisexual, sterile; limb 5-fid. *Anthers* obtuse and entire at the base. *Style* of disc-florets entire, or the branches linear, connivent. *Achenes* plano-compressed, obovate-oblong in outline, densely-silky. *Pappus* bristles in 1 row, rigid, plumose.

A pubescent-hirsute shrublet; leaves alternate, narrow, entire; heads medium-sized, solitary on long peduncles.

Endemic; species 1, found in the south-western districts.

8849

12. SOLIDAGO, Linn.

Heads heterogamous, radiate. *Involucre* oblong in outline or narrowly campanulate; bracts in many series, imbricate, coriaceous, or the margins scarious, rarely some herbaceous or squarrose at the apex; the outer gradually smaller. *Receptacle* small, often honeycombed. *Ray florets* yellow or pale coloured, 1-seriate, often few, usually female. *Disc florets*

bisexual, fertile. *Corolla* tubular; limb a little widened or narrowly campanulate, 5-fid. *Anthers* obtuse and entire at the base. *Style-branches* of disc florets flattened, with a lanceolate appendage. *Achenes* sub-terete or angular, more or less distinctly 8-12-ribbed, typically glabrous. *Pappus* bristles slender, copious, scabrid, in 1-2-series.

Herbs, often perennial, very rarely shrubby at the base; leaves alternate, entire or often toothed; heads small, rarely medium-sized, variously grouped.

Species about 180, mostly North American; 1 species occurs as a weed in the Transvaal.

8859

13. FRESENIA, DC.

Heads homogamous, 15-16-flowered. *Involucre* campanulate; bracts 3-seriate, imbricate, linear, sub-membranous on the margin, bearing a dorsal row of 1-3 glands. *Receptacle* somewhat convex, scarcely pitted. *Corolla* tubular; limb scarcely widened at the throat, 5-toothed. *Anthers* obtuse at the base. *Style-branches* flattened, lanceolate above. *Achenes* compressed, silky-villous. *Pappus* in 2 rows; the outer of short narrow scales; the inner of long rough bristles.

Glabrous shrublets; leaves opposite or alternate, entire; heads moderately large, solitary, terminal; flowers pale yellow.

Endemic; species 5, recorded from Clanwilliam, the Karroo, and S.W. Africa.

8861

14. ENGLERIA, O. Hoffm.

Heads homogamous or heterogamous, discoid or radiate. *Involucre* broadly ovoid; bracts in many series; the inner spreading, with scarious margins; the outer squarrose, gradually smaller. *Receptacle* convex, nude. *Ray* florets female. *Disc florets* bisexual. *Corolla-tube* short; limb sub-cylindric, broadly 5-toothed. *Anthers* obtuse and entire at the base. *Style-branches* flattened, elongated, linear, obtuse. *Achenes* narrowly winged, hirsute. *Pappus* of rigid barbellate bristles, with an outer series of narrow palae.

Herbs (or shrubs?); leaves membranous, opposite, or the upper sub-opposite; heads grouped in cymes, or solitary in the axils of the leaves; peduncle long.

Endemic; species 2, found in S. W. Africa.

8862

15. PTERONIA, Linn.

Heads homogamous, discoid, 1 to many-flowered. *Involucre* campanulate, ovoid or cylindric; bracts in several series, imbricate, often chaffy, with membranous glabrous or ciliate margins, sometimes spine-tipped; the outer gradually smaller. *Receptacle* convex, flat, or concave, often deeply honeycombed; the pits with marginal setae or lacerated. *Corolla* tubular; limb turbinate or sub-campanulate, 5-lobed. *Anthers* obtuse, rarely acute at the base. *Style-branches* flattened, with short or rather long appendages. *Achenes* turbinate, or more or less compressed and then often glabrous, frequently villous, often contracted into a neck at the apex. *Pappus* of numerous bristles, rarely somewhat 1-seriate, often connate at the base into a ring, very unequal, more or less barbellate or sub-pilose, mostly straw coloured, rarely purple.

Much branched shrubs, rarely with decumbent branches rooting at the nodes, often viscid; leaves alternate or mostly opposite, entire or ciliate-serrulate, coriaceous or fleshy, woolly, tomentose, papillose, or glabrous, rarely warted, sometimes very small and clustered; heads grouped in a corymb, or terminal and solitary; corolla yellow, rarely purplish or greenish.

Endemic; species 64, generally distributed in the Karroo, Namaqualand, and S.W. Africa; also found in the south western districts and eastwards as far as Peddie; absent from the Transvaal and Natal.

8866

16. *DICHROCEPHALA*, L'Her.

Heads heterogamous; marginal florets female; central florets male or bisexual, few. *Involucre* sub-2-seriate; bracts ovate, sub-equal. *Receptacle* conical, naked. *Female florets* in many rows. *Corolla-tube* slender, 2-4-toothed. *Anthers* truncate and sub-entire at the base, with an obscure or conspicuous apical appendage. *Male or bisexual florets* few. *Corolla-limb* campanulate, 4-5-toothed. *Style-branches* short, flattened, with a lanceolate appendage. *Achenes* compressed. *Pappus* absent in the female florets; in the male or bisexual florets of 1-2 minute bristles.

Annual herbs; leaves alternate, deeply toothed or lyrate-pinnatifid; heads small, grouped in a terminal panicle, or rarely solitary; corolla of marginal florets white, of central flowers purple or violet.

Species about 11, found in Africa and Asia; 1 species found as a weed in the Transvaal, Swaziland, and Natal.

8881

17. *CHARIEIS*, Cass.

Heads heterogamous, many-flowered, radiate. *Involucre* broadly campanulate; bracts in 1-2 rows; the outer bracts infolded and keeled; the inner bracts with a green keel and membranous on the margins. *Receptacle* flat, honeycombed. *Ray florets* ligulate, in 1 row, female. *Disc florets* perfect, rarely sterile. *Corolla-tube* short; limb campanulate, shortly 5-fid. *Anthers* entire and truncate at the base. *Style-branches* flattened, cuneate, with a very short triangular appendage at the apex. *Achenes* compressed, thickened on the edges, pilose. *Pappus* absent from the ray florets; of the disc florets of feathered bristles in a single row.

An annual herb; leaves opposite below, alternate above; head solitary at the apex of a long peduncle; disc florets blue or yellow; rays blue.

Endemic; species 1, found from Saldanha Bay to Riversdale.

8882

18. *GYMNOSTEPHIUM*, Less.

Heads heterogamous, many-flowered, radiate. *Involucre* various in shape; bracts imbricate, in a few series. *Receptacle* convex or sub-conical, honeycombed. *Ray florets* ligulate, in one row, female, fertile. *Disc florets* sterile. *Corolla* tubular; limb broadened, shortly 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* narrow, with a narrow lanceolate appendage. *Achenes* of rays compressed, with thickened margins, glandular-scabrid; of disc florets linear, empty. *Pappus* absent from ray florets, or represented by 1-2 bristles only; of disc florets of a few caducous feathery or barbellate bristles.

Half-herbaceous or shrubby plants, with slender rod-like leafy branches; leaves alternate, linear or subulate, entire; heads solitary at the end of a peduncle; disc florets yellow; rays blue.

Endemic; species 8, found in the south-western districts as far as Riversdale.

8883

19. *MAIRIA*, Nees

Heads heterogamous, many-flowered, radiate. *Involucre* campanulate or hemispherical; bracts imbricate, in a few series. *Receptacle* flat, naked. *Ray florets* ligulate, apparently in one row, female, fertile. *Disc florets* fertile or sterile. *Corolla-tube* short; limb often wide, shortly 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* narrow, flattened, often with a linear-subulate appendage, or the style of the sterile florets undivided. *Achenes* compressed, glabrous or sparsely pilose. *Pappus* bristles, sub-1-seriate, plumose or sub-plumose.

Herbaceous perennials, or small slender shrubby plants; stem or branches naked at the summit; leaves alternate; heads solitary, peduncled, rarely arranged in a corymb; disc florets yellow; rays blue, white, or yellow.

Endemic; species 13, extending in the coastal districts from Clanwilliam to Knysna.

8887

20. AMELLUS, Linn.

Heads mostly heterogamous, many-flowered, radiate. *Involucre* ovoid, campanulate, or sub-hemispherical; bracts in many series, imbricate, rigid, acuminate; the inner resembling the paleae. *Receptacle* convex or sub-conical, covered with paleae between the florets. *Ray florets* ligulate, in one series, female, fertile. *Disc florets* bisexual, fertile. *Corolla* tubular; limb slightly widened, 5-toothed. *Anthers* entire and obtuse at the base. *Style-branches* narrow, flattened, with a lanceolate or narrow appendage. *Achenes* wedge-shaped, compressed, with the margins often thickened; achenes of ray florets somewhat 4-angled. *Pappus* of ray florets of a few very short unequal scales; of disc florets double; the outer similar to that of the rays; the inner of 4-5 scabrous deciduous bristles; pappus rarely of a few sub-plumose bristles on the ray and disc achenes.

Herbs or small suffrutices; lower leaves opposite, upper alternate, entire or few-toothed, strigillose or canescent; heads solitary on a terminal peduncle; disc florets yellow; rays blue.

Endemic; species 12, found in S.W. Africa, Namaqualand, the north-western districts, and a few of the central districts, and extending to Riversdale, Uitenhage, and Kingwilliamstown; also found at Middleburg in the Cape Province.

8900

21. ASTER, Linn.

(Astrosperma, Less.)

Heads heterogamous, very rarely homogamous, many-flowered, radiate, or very rarely rays reduced. *Involucre* variously campanulate or hemispherical; bracts in many series, imbricate, with scarious margins, or the apex herbaceous; the outer smaller or rarely herbaceous and sub-equaling the inner. *Receptacle* flat or convex, very often honeycombed. *Ray florets* ligulate, in 1-2 rows, female, fertile, or rarely sterile. *Disc florets* all fertile, or rarely the inner or all sterile. *Corolla* tubular; limb long, slightly widened, shortly 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* flattened, with a variously-shaped papillose or bristly appendage. *Achenes* compressed. *Pappus* bristles many, slender, scabrous, irregularly in 2-3 rows, caducous or sub-persistent.

Perennial herbs, rarely sub-woody at the base, very rarely annuals; leaves alternate or opposite, entire, toothed, or rarely incised; heads in a raceme, panicle, or corymb, or (in the South African species) peduncled and solitary; disc florets yellow, very rarely purple; rays blue, violet, or white.

Species described about 750, mostly massed in North America; 27 species found in South Africa, generally distributed.

8901

22. ERIGERON, Linn.

Heads heterogamous, many-flowered, discoid; marginal florets female. *Involucre* hemispherical or campanulate; bracts sub-2-seriate, narrow, often numerous, sub-equal. *Receptacle* flat or scarcely convex, nude, or rarely honeycombed and with very short paleae or fimbriate. *Ray florets* red or white, female, in 2 to many series, all (or the outer) ligulate, narrow or very narrow, sometimes tubular-filiform and scarcely toothed, fertile, longer than the style. *Disc florets* bisexual, fertile or rarely sterile. *Corolla* tubular; limb slightly widened; lobes or teeth 5. rarely 4. short. *Anthers*

entire and obtuse at the base. *Style-branches* more or less flattened, with a variously shaped terminal appendage. *Achenes* compressed. *Pappus* *bristles* slender, copious, rough.

Perennial or annual herbs; leaves alternate; heads in a corymb, or panicle, or solitary, medium-sized or small.

Species about 400, widely dispersed, especially in temperate regions; 3 species naturalised in South Africa and fairly widely spread.

8919

23. FELICIA, Cass.

(Diplopappus, DC.)

Heads heterogamous, radiate. *Involucre* hemispherical or campanulate; bracts in 2 to many rows, imbricate, narrow, with scarious margins; the outer gradually smaller or sub-equaling the inner. *Receptacle* flat, often honeycombed. *Ray florets* in 1-2 rows, female, fertile, or rarely sterile. *Disc florets* bisexual, fertile, rarely the inner or all sterile. *Corolla* tubular; limb long, somewhat widened, shortly 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* flattened, with a lanceolate appendage. *Achenes* compressed, sometimes faintly 1-2-ribbed. *Pappus* *bristles* slender, in 1 row, scabrid, often caducous, rarely sub-persistent.

Shrubs, or rarely annual herbs; leaves alternate, entire or toothed; heads solitary, often on long peduncles, small or medium-sized; rays blue or white; disc florets yellow.

An African genus of about 65 species, mostly found in South Africa and there fairly widely distributed.

8921

24. MICROGLOSSA, DC.

Heads heterogamous, minutely radiate. *Involucre* campanulate; bracts in many series, imbricate, linear-lanceolate, sub-obtuse, somewhat scarious; the outer smaller. *Receptacle* flat, nude or slightly fimbriated. *Ray florets* in 1 to many rows, female, narrowly-ligulate, not or scarcely exceeding the style. *Disc florets* bisexual, few or many, all fertile. *Corolla* tubular; limb elongated, widened, 2-fid at the apex. *Anthers* entire and obtuse at the base. *Style-branches* flattened, with a long lanceolate appendage. *Achenes* angled (compressed?). *Pappus* *bristles* slender, copious, in 1-2 rows, slightly unequal.

Shrubs, with elongated lax branches, or sub-scandent; leaves alternate, ovate or lanceolate, entire; heads small, in a corymb, or the corymbs arranged in a panicle.

Species about 17, mostly tropical African; also found in Asia; 1 species in South Africa, recorded from the Uitenhage district.

8923

25. PSIADIA, Jacq.

Heads heterogamous, radiate. *Involucre* campanulate; bracts in many series, imbricate, narrow; the outer smaller. *Receptacle* flat, nude. *Ray florets* in many series, female, fertile, ligulate or sub-filiform, rarely longer than the style. *Disc florets* few, bisexual, sterile. *Anthers* entire and obtuse at the base. *Style-branches* narrow, with a short or elongated-lanceolate appendage. *Achenes* of ray florets small, 3-5-angled, slightly compressed; achenes of disc florets empty. *Pappus* *bristles* slender or rigid.

Shrubs, sometimes glabrous and glutinous, sometimes silky-villous or hirsute; leaves alternate, entire or toothed; heads small or medium-sized, often numerous, rarely few, arranged in a corymb; flowers few or very numerous; rays yellow.

Species about 49, found in tropical Africa and the Mascarene Islands; 1 species recorded from S.W. Africa.

8925

26. NIDORELLA, Cass.

Heads heterogamous, minutely radiate. *Involucre* campanulate or sub-hemispherical; bracts sub-2-seriate, slightly unequal; the outer green on the back; the inner sub-membranous. *Receptacle* flat or convex, naked, or often honeycombed and fimbriate. *Ray florets* in many rows, female, ligulate, with the lip entire, or 2-fid and sub-bilabiate, longer than the style. *Disc florets* bisexual, fertile. *Corolla* tubular; limb slightly widened, 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* narrow, flattened, with a short or elongated lanceolate appendage. *Achenes* compressed, mostly hairy. *Pappus bristles* in 1 row, slender or rigid, somewhat rough.

Perennial herbs or shrubs, pubescent, villous, or tomentose; leaves alternate, narrow, entire, toothed, or incised; heads small, arranged in a corymb, rarely the heads solitary and peduncled; flowers all yellow, with the rays sometimes paler than the disc florets.

An African genus of about 35 species; 23 species in South Africa, extending from the Transvaal and Natal as far as Uitenhage; also found in Bechuanaland, and the north-western districts.

8926.

27. CONYZA, Linn.

Heads heterogamous, discoid; marginal florets female. *Involucre* campanulate; bracts in 2 to many series, imbricate, lanceolate or linear, sometimes very narrow; the outer smaller. *Receptacle* flat or somewhat convex, nude or honeycombed, with the margins of the pits fimbriate or produced into very short paleae. *Marginal florets* in 2 to many rows, filiform, 2-3-toothed, shorter than the styles. *Disc florets* bisexual, all or some fertile. *Corolla* tubular; limb slightly widened, 5-toothed above. *Anthers* entire and obtuse at the base. *Style-branches* flattened, often narrow, with a short or elongated lanceolate appendage. *Achenes* small, compressed, mostly glabrous. *Pappus bristles* slender, in 1 row, or rarely 2 rows with the outer bristles shorter.

Annual or perennial herbs, or rarely shrubs; leaves alternate, entire toothed, or rarely dissected; heads in a corymb or panicle, rarely solitary.

Species about 120, found in the tropical and sub-tropical regions; few in temperate regions; 10 species in South Africa, extending from the Transvaal, Natal, Basutoland, and the O.F.S. to the south-western districts; also found in the north-western districts.

8929

28. NOLLETIA, Cass.

(Leptothamnus, DC.)

Heads heterogamous, discoid; the marginal florets female. *Involucre* hemispherical; bracts in a few series, acute; the outer somewhat smaller. *Receptacle* flat or somewhat convex, slightly honeycombed. *Marginal florets* in 1 row, filiform. *Disc florets* bisexual, fertile, or some sterile. *Corolla* tubular; limb slightly widened, 5-toothed. *Anthers* entire and obtuse at the base. *Style-branches* flattened, with a lanceolate appendage. *Achenes* compressed, pileæ. *Pappus bristles* slender, caducous.

Shrubs or suffrutices; leaves alternate, linear or subulate, often rigidly ciliate; heads medium-sized or small, solitary at the apices of the branches; florets yellow.

Species 6, all African; 4 species in South Africa, found in the Transvaal, Natal, the O.F.S., and S.W. Africa; also recorded from Middleburg, C.P.

8930

29. CHRYSOCOMA, Linn.

Heads homogamous, many-flowered, discoid. *Involucre* hemispherical or broadly campanulate; bracts in a few series, imbricate, narrow, with a scarious margin; the outer gradually smaller. *Receptacle* flat or somewhat convex, more or less honeycombed. *Corolla* tubular; limb slightly widened, 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* narrow, flattened, with a lanceolate appendage. *Achenes* compressed, often villous. *Pappus* bristles slender, rough.

Branching shrublets; leaves alternate, linear, entire, rarely lobed or pinnatifid; heads globose, terminal, solitary on long or short peduncles, rarely in corymbs; florets yellow.

Endemic; species 15, with a south-western and central distribution, but extending into Basutoland, Natal, the O.F.S., and the Transvaal.

8931

30. HETEROMMA, Benth.

(*Chrysocoma*, Linn., sect., *Heteropsis*.)

Heads homogamous, many-flowered, discoid. *Involucre* hemispherical; bracts in 2-3 series; the inner membranous at the apex; the outer narrow and shorter. *Receptacle* somewhat convex, scarcely honeycombed. *Corolla* with a short tube; limb campanulate, 5-fid. *Anthers* entire and truncate at the base. *Style-branches* flattened, with a short triangular appendage, obtuse, bristly. *Achenes* often oblique, compressed, shortly pubescent. *Pappus* bristles copious, in 2-3 rows.

Erect herbs; leaves alternate, entire or pinnatifid; heads small, arranged in a corymb; florets yellow.

Endemic; species 2, found in Natal, Basutoland, and the eastern O.F.S.

8931a

31. PENTHERIELLA, O. Hoffm. & Muschler

Heads homogamous, many-flowered, discoid. *Involucre* hemispherical or broadly campanulate; bracts in 3 series, slightly imbricate at the base, broadly lanceolate or ovate-lanceolate; the outer in form and hairiness like the reduced leaves; the inner with slightly scarious margins. *Receptacle* flat or slightly convex, more or less honeycombed. *Florets* all bisexual, or the inner florets often sterile. *Corolla* tubular, abruptly narrowed at the middle; the limb slightly widened, 5-fid. *Anthers* entire and obtuse at the base. *Style-branches* short, flattened, with a lanceolate obtuse appendage. *Achenes* small, somewhat compressed, irregularly 5-ribbed, often villous. *Pappus* bristles fine, hyaline, in 1 row, unequal, partly free above, united at the base.

An unbranched shrub; leaves alternate, linear, entire or sometimes few-toothed; heads medium sized, arranged in a small corymb; florets yellow.

Endemic; species 1, recorded from Van Reenen's Pass in Natal.

8936

32. BRACHYLAENA, R.Br.

Heads unisexual, discoid, one to many-flowered. *Involucre* ovoid or campanulate; bracts in many series, imbricate, coriaceous; the outer gradually smaller. *Receptacle* small, somewhat convex, nude. *Bisexual florets* with only the anthers functional. *Corolla* tubular, slender; limb ample, elongated, 5-fid. *Anthers* tailed at the base. *Style* undivided, filiform. *Ovary* hispid, abortive. *Pappus* of a few short bristles. *Female florets*: *Corolla* filiform, 3-5-fid. *Style-branches* short, broad. *Achenes* 4-5-angled, hairy or glabrous. *Pappus* bristles copious, sub-2-seriate, scabrid or sub-barbellate.

Shrubs or small trees ; leaves alternate, entire or toothed, often tomentose beneath : heads in a raceme or panicle.

An African genus of about 12 species ; 8 species recorded in South Africa (there are several undescribed), extending from the Transvaal, Natal, and the eastern districts to the south-western districts.

8937

33. *TARCHONANTHUS*, Linn.

Plants dioecious. *Heads* unisexual, discoid, many-flowered, or the female sometimes 1-flowered. *Involucre* campanulate ; bracts in male heads of 5 scales, connate to their middle ; bracts in female heads free, many, in two rows. *Receptacle* somewhat convex, hairy. *Bisexual florets* with only the anthers functional. *Corolla* tubular ; limb widened above, 5-fid. *Anthers* tailed at the base. *Style* undivided or very shortly bifid, thickened above. *Pappus* 0. *Female florets* : *Corolla* tubular, with 3-4 thick spreading teeth. *Achenes* very woolly. *Pappus* 0.

Trees or shrubs ; leaves alternate, entire or lobed above, tomentose beneath ; heads small, in terminal and (or) axillary panicles, rarely sub-solitary and axillary.

Species 5 ; 4 in South Africa, with a wide distribution ; 1 species described from Mexico.

8939

34. *BLUMEA*, DC.

Heads heterogamous, discoid ; the marginal florets female, in many rows. *Involucre* ovoid or campanulate ; bracts in many series, imbricate ; the outer gradually smaller. *Receptacle* flat, nude. *Marginal florets* with a filiform corolla, minutely 2-3-toothed. *Disc florets* few (5-25), fertile, rarely sterile. *Corolla* tubular ; limb slightly widened, 5-toothed. *Anthers* tailed at the base. *Style-branches* flattened or almost filiform, dorsally papillose. *Achenes* small, sub-terete or angled, with prominent ribs, glabrous or pilose. *Pappus* bristles slender, in one row, often caducous.

Annual or perennial herbs, rarely shrubby at the base, glandular-pubescent, villous, or sub-woolly ; leaves alternate, toothed, lobed, or rarely entire ; heads usually in a panicle, sometimes in glomerules, rarely solitary ; corolla purplish, rarely yellow.

Species about 159, found in the warmer parts of Asia, Africa, and Australia ; 6 species in South Africa, recorded from the Transvaal, Natal, and Namaqualand.

8940

35. *LAGGERA*, Sch. Bip.

Heads heterogamous, discoid ; the marginal florets female, in many rows. *Involucre* campanulate or hemispherical ; bracts in many series, imbricate, often tightly adpressed or recurved ; the outer gradually smaller. *Receptacle* flat, nude. *Marginal florets* with a filiform corolla, minutely toothed at the apex. *Disc florets* bisexual, fertile (or sterile ?). *Corolla* tubular ; limb slightly widened, 5-toothed. *Anthers* very shortly 2-lobed or sagittate at the base, never distinctly tailed. *Style-branches* linear-subulate, papillose. *Achenes* small, glabrous or sparsely pilose. *Pappus* bristles slender, in 1 row, free or very shortly connate at the base.

Annual or perennial herbs, or shrubby at the base, sometimes glandular ; leaves alternate, entire or toothed, often rigid and decurrent on the stem, rarely sessile and cordate-amplexicaul ; heads variously paniced or sub-sessile in the upper axils ; corolla yellow or mauve-pink.

Species about 20, found in tropical Africa and East India ; 3 species in South Africa, found in the Transvaal, Natal, and S.W. Africa.

8941

36. PLUCHEA, Cass.

Heads heterogamous, discoid; the marginal florets female, in many rows. *Involucre* ovoid, broadly campanulate or sub-hemispherical; bracts in few or many series, imbricate, dry, rigid or sub-membranous. *Receptacle* flat, nude. *Marginal florets* with a filiform corolla 3-fid or minutely toothed at the apex. *Disc florets* bisexual, fertile, or often a few sterile. *Corolla* tubular; limb slightly widened, 5-fid. *Anthers* sagittate at the base. *Style-branches* filiform, bristly or papillose, sometimes style undivided. *Achenes* small, not or scarcely compressed, 4-5-angled, glabrous or pilose. *Pappus* bristles slender, rigid, in 1 row, or more or less united at the base on the sterile achenes.

Bushes or shrubs, rarely perennial herbs, tomentose, villous, or sometimes glutinous; leaves alternate, toothed, or rarely entire or pinnatifid; heads usually small, sometimes large, typically arranged in a leafless corymbose cyme; in a few species heads terminal and solitary, or grouped at the apex of almost leafless branches; florets white, yellow, or lilac.

Species about 45, found in the warm parts of America, Africa, Asia, and Australia; 1 species recorded from Natal.

8943

37. PECHUEL-LOESCHEA, O. Hoffm.

Heads heterogamous, discoid; the marginal florets female, in 1 row. *Involucre* turbinate; bracts in many series, imbricate, dry; the outer ovate, pubescent and minutely glandular; the inner longer, lanceolate, glabrous. *Receptacle* flat, nude. *Marginal florets* with a filiform corolla, shortly 4-fid at the apex. *Disc florets* bisexual, numerous, fertile. *Corolla* tubular; limb slightly widened, 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* filiform, papillose. *Achenes* terete, pubescent, slightly ribbed. *Pappus* bristles slender, persistent, free, in 1 row.

A branched shrub, slightly tomentose; leaves alternate, sessile, entire, more or less decurrent; heads in a large axillary panicle, or solitary, or grouped in the leaf-axils.

Endemic; species 1, found in S.W. Africa.

8949

38. DENEKIA, Thunb.

Heads heterogamous, discoid; the marginal florets in many rows, female, fertile. *Involucre* campanulate, sub-hemispherical; bracts sub-biseriate, slightly unequal, rigidly herbaceous, with scarious margins. *Receptacle* flat, nude. *Marginal florets* filiform, bifid at the apex. *Disc florets* bisexual, sterile. *Corolla* tubular; limb campanulate, 5-fid. *Anthers* shortly sagittate at the base. *Style-branches* flattened, short, broad, ovate, minutely papillose. *Achenes* of female florets sub-terete, not ribbed, pilose; of the disc florets narrow, empty. *Pappus* of female florets 0; of disc florets of 1-2 long scales, palmately fimbriate at the apex.

Annual herbs; leaves alternate, entire or undulate, sometimes woolly beneath; heads small, arranged in a panicle of corymbs.

An African genus of two species, both of which occur in South Africa; found in the Transvaal, Natal, Basutoland, the O.F.S., and in the eastern districts to Uitenhage; also recorded from the north-western districts.

8951

39. NICOLASIA, Sp. Moore

Heads heterogamous, discoid; the marginal florets female. *Involucre* broadly campanulate; bracts in a few series, imbricate, narrow, membranous. *Receptacle* flat, nude. *Marginal florets* fertile. *Corolla* filiform, minutely toothed at the apex. *Disc florets* bisexual, fertile. *Corolla*

tubular, 5-fid above. *Anthers* tailed at the base. *Achenes* small, compressed. *Pappus* of 3 caducous bristles.

A dwarf shrub ; leaves alternate, entire or toothed ; heads small, solitary, or few at the apex of the branches.

An African genus of 4 species ; 2 species recorded from S.W. Africa.

8953

40. EPALTES, Cass.

(Litogyne, Harv.)

Heads heterogamous, discoid ; the marginal florets in many rows, rarely all female and fertile. *Involucre* ovoid, campanulate or hemispherical ; bracts in many series, imbricate, dry, rigid, often broad. *Receptacle* flat, or elevated and concave in the middle, nude or minutely honeycombed. *Marginal florets* with a filiform corolla, minutely 2-3-toothed. *Disc florets* bisexual, very often sterile. *Corolla* tubular ; limb slightly widened or campanulate, shortly 3-5-fid. *Anthers* sagittate at the base. *Style* undivided or very shortly bifid, papillose at the apex. *Achenes* in the female florets sub-terete, 5-10-ribbed ; in the bisexual florets often abortive. *Pappus* in the female florets 0 ; in the bisexual florets of 2-3 caducous bristles, or often 0.

Erect or diffuse herbs ; leaves alternate, entire, toothed, or rarely sublyrate, often decurrent on the stems ; heads small, usually arranged in a corymb of cymes, or rarely sessile on the branches.

Species about 9, found in the warm parts of America, Africa, and southern tropical Asia ; also in Australia ; 2 species in South Africa, recorded from the Transvaal.

8954

41. PORPHYROSTEMMA, Benth.

Heads heterogamous, radiate. *Involucre* hemispherical ; bracts in many rows, narrow, imbricate ; the outer gradually smaller. *Receptacle* flat, honeycombed, pilose. *Ray florets* in many rows, female. *Corolla* very narrowly ligulate, not or scarcely exceeding the involucre. *Disc florets* bisexual, fertile. *Corolla* regular, tubular, scarcely widened into a limb, shortly 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* linear, somewhat flattened, rounded at the apex. *Achenes* small, densely silky-villous. *Pappus* double ; the outer of many very short fimbriate paleae ; the inner of 5-6 fine long bristles.

An erect herb, branched, hirsute ; leaves alternate, narrow, entire or glandular-toothed ; heads large, peduncled, arranged in a lax panicle of corymbs ; florets purple (?), the apex of the disc florets pilose.

An African genus of 2 species ; 1 species in South Africa (record doubtful).

8955

42. SPHAERANTHUS, Linn.

Heads heterogamous, discoid. *Involucre* narrow ; bracts few or many, narrow, acute, slightly unequal. *Receptacle* small, naked. *Marginal florets* female, few or many, fertile. *Corolla* slender, tubular, minutely 2-3-toothed. *Disc florets* bisexual, solitary or few, fertile or sterile. *Corolla* regular, with a 4-5-toothed limb. *Anthers* sagittate at the base. *Style* undivided, or the branches filiform, papillose without. *Achenes* oblong, somewhat compressed. *Pappus* none.

Erect villous herbs ; leaves alternate, toothed, decurrent on the stem ; heads in solitary glomerules at the apices of the branches.

Species about 26, found in tropical Asia, Africa, and Australia ; 4 species in South Africa, found in the Transvaal and from Natal to Komgha ; also recorded from S.W. Africa.

8967

43. IFLOGA, Cass.

(Trichogyne, Less.)

Heads heterogamous, discoid. *Involucral bracts* few, hardly exceeding the paleae of the receptacle. *Receptacle* cylindric at the base or slightly elevated, covered with scarious sub-hyaline imbricate paleae subtending the female flowers, with the apex flat and nude. *Marginal florets* female, in 1 to many rows, fertile. *Corolla* filiform, scarcely toothed. *Disc florets* bisexual, sterile. *Corolla* narrowly tubular, with the limb slightly widened, 5-toothed. *Anthers* sagittate at the base. *Style* of the bisexual florets undivided, or the branches very thinly truncate. *Achenes* of the female florets oblong in outline, glabrous, of the bisexual florets abortive. *Pappus* in female florets absent; in the bisexual florets of a few bristles in one row, plumose at the apex or sometimes at the base.

Shrublets or annual herbs, cano-tomentose or glabrate; leaves alternate, small, linear often fascicled in the axils; heads crowded at the ends of the branchlets.

Species 10, found in India, Africa, and the Canary Islands; 8 species in South Africa, found in the south-western districts, extending to Namaqualand and eastwards to Uitenhage; also occur in the central districts, the O.F.S., and the Transvaal.

8972

44. AMPHIDOXIA, DC.

Heads heterogamous, discoid. *Involucre* campanulate; bracts in many series, scarious; the inner broadened; the outer shorter and woolly on the back. *Receptacle* flat, nude. *Marginal florets* female, in many rows, fertile. *Corolla* filiform, scarcely toothed. *Disc florets* bisexual, often sterile. *Corolla* tubular, not dilated above, 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* thin, truncate at the apex, sub-capitate. *Achenes* of the female florets small, oblong, glabrous; of the bisexual florets empty. *Pappus* in the female florets none; in the bisexual florets of 2-6 bristles barbellate at the apex.

Woolly or cano-tomentose herbs; leaves alternate; heads small, clustered at the apices of the branches.

Endemic; species 6, found in the Transvaal and from Natal to Uitenhage; also occur in the north-western districts and Bechuanaland.

8987

45. LASIOPOGON, Cass.

Heads heterogamous, discoid. *Involucre* campanulate; bracts in a few rows; the inner narrow, scarious; the outer shorter, sub-herbaceous, woolly on the back. *Receptacle* small, nude. *Marginal florets* in 2 to many rows, female. *Corolla* filiform, minutely toothed. *Disc florets* bisexual, few or many, fertile. *Corolla* slender, tubular, with a slightly widened limb, 3-toothed. *Anthers* sagittate at the base. *Style-branches* slender, sub-dilated and truncate at the apex. *Achenes* oblong, attenuated at the apex, glabrous or papillose. *Pappus* bristles in a single row, distinct, caducous leaving a scar, long and finely plumose.

Small annual herbs, densely woolly; leaves alternate, small, entire; heads small, many, crowded into a cyme, sub-glomerate.

Species 3, found in north Africa, Spain, Asia, and India; the 3 species occur in South Africa, and are found in the north-western districts and Namaqualand.

8990

46. ACHYROCLINE, Less.

Heads heterogamous, discoid. *Involucre* oblong; bracts in many rows, imbricate, scarious; the outer gradually smaller; the outermost scarcely woolly above. *Receptacle* small, nude, or with small short paleae. *Marginal florets* 3-6, female, fertile. *Corolla* filiform, minutely toothed or shortly 2-4-fid. *Disc florets* 1-2, bisexual, fertile. *Corolla* tubular, slender, swollen at the base, with the limb slightly widened, shortly 5-fid. *Anthers* sagittate at the base. *Style-branches* slender, truncate. *Achenes* oblong in outline, sub-compressed. *Pappus bristles* scabrid, caducous, leaving a scar.

Erect shrubs, tomentose, woolly, or rarely glabrescent; leaves alternate, petioled, sessile or decurrent; heads in dense cymes aggregated in head-like groups; cymes often large and paniced.

Species about 25, found in America, tropical Africa, and Madagascar; one species recorded from Natal.

8992

47. GNAPHALIUM, Linn.

Heads heterogamous, discoid. *Involucre* ovoid or campanulate; bracts in many rows, imbricate, wholly scarious, or scarious at the apex only; the outer shorter, often woolly on the back; the inner spreading, appendiculate. *Receptacle* flat, convex, or sub-conical, honeycombed or nude. *Marginal florets* in 2 to many rows, female, fertile. *Corolla* filiform, minutely toothed or shortly 3-4-fid at the apex. *Disc florets* bisexual, few, fertile. *Corolla* slender, tubular, with the limb slightly widened, 5-toothed or shortly 5-fid. *Anthers* sagittate at the base. *Style-branches* sub-terete, truncate or sub-capitate at the apex. *Achenes* oblong or obovate in outline, glabrous or papillose, rarely hairy. *Pappus bristles* in 1 row, slender, or thickened at the apex, caducous leaving a scar, or more or less connate at the base into a ring.

Herbs, rarely woody at the base, cano-tomentose or woolly; leaves alternate, entire, sessile, decurrent, rarely petioled; heads small, in glomerate cymes, or rarely solitary.

Species about 224, widely distributed; 26 species in South Africa, fairly widely distributed.

8994

48. CASSINIA, R.Br.

(Rhynea, DC.)

Heads homogamous, rarely heterogamous, discoid. *Florets* all bisexual and fertile, or rarely a few marginal florets female. *Involucre* narrowly ovate or oblong in outline; bracts in many rows, imbricate, erect, or the inner appendiculate and spreading; the outer gradually smaller. *Receptacle* flat or convex, with few or many paleae. *Corolla* of marginal florets (when present) filiform, minutely toothed. *Corolla* of bisexual florets tubular, with the limb slightly widened or narrowly campanulate, shortly 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* sub-terete, truncate. *Achenes* small, angular or sub-terete, glabrous or papillose. *Pappus bristles* slender, in 1 row, free or slightly connate at the base.

Shrubs, rarely shrublets or herbs; leaves alternate, flat or with revolute margins, often tomentose beneath; heads small, corymbose at the apices of the branches, or paniced.

Species about 25, found in Australia and New Zealand; one species found in the Transvaal and Natal.

8995

49. PETALACTE, D. Don

Heads heterogamous, discoid. *Involucre* campanulate; bracts in a few series, villous-woolly; the inner with a petaloid lamina, spreading, appendiculate; the outer few, with a smaller lamina, or lamina none. *Receptacle* small, with paleae in many marginal rows, sub-nude in the centre. *Marginal florets* female, 1-3 fertile. *Corolla* filiform, or slender and tubular, minutely toothed. *Disc florets* bisexual, many sterile. *Corolla* tubular, with the limb narrowly campanulate, 5-fid. *Anthers* sagittate at the base. *Style* undivided. *Achenes* of female florets oblong in outline; of bisexual florets slender, empty. *Pappus bristles* in 1 row, free; of the bisexual florets barbellate or penicillate.

Shrubs, cano-tomentose or woolly; leaves alternate; heads small, grouped in terminal cymes or corymbs.

Endemic; species 1, found in the south-western districts.

8996

50. PETALACTELLA, N.E.Br.

Heads heterogamous, discoid. *Involucre* campanulate; bracts in sub-3-series; the outermost bracts subtending the female florets; inner shorter, spreading. *Receptacle* small, nude. *Marginal florets* female, 2-4 fertile. *Corolla* compressed-tubular, minutely toothed. *Disc florets* male, sterile. *Corolla* tubular, with a narrowly campanulate limb, 5-fid. *Anthers* shortly sagittate at the base. *Style-branches* of female florets linear, obtuse or truncate; style of male florets undivided. *Achenes* sub-3-angled. *Pappus bristles* of male florets few, free, penicillate at the apex; of female florets absent or sometimes 1-2.

A shrub with ericoid leaves; leaves alternate; heads small, aggregated at the ends of the branches.

Endemic; species 1, recorded from Harrismith in the O.F.S.

8997

51. PHAENOCOMA, D. Don

Heads heterogamous, discoid. *Involucre* hemispherical; bracts in many series, rigid; the inner scarious, coloured; the outer gradually smaller. *Receptacle* flat, nude. *Marginal florets* in one series, female, fertile. *Corolla* tubular, slender, minutely 6-toothed. *Disc florets* bisexual, many, sterile. *Corolla* as in the marginal florets. *Anthers* sagittate at the base. *Style-branches* of the female florets obtuse; style of bisexual florets undivided. *Achenes* of the marginal florets villous; achenes of the disc-florets, 5-angled, empty, glabrous. *Pappus bristles* in one row, rigid and somewhat connate into a ring at the base, scabrid-toothed at the apex; of the female florets copious; of the bisexual florets fewer.

A rigid shrub; leaves minute, imbricated on the lateral branchlets to form tubercle-like swellings; heads large, terminal, solitary; involucre bracts reddish.

Endemic; species 1, found in the south-western districts as far as Riversdale.

8998

52. ANAXETON, Cass.

Heads heterogamous, discoid. *Involucre* ovoid or campanulate; bracts in many series, imbricate; the inner appendiculate, with a radiating petaloid lamina; the outer shorter, adpressed, glabrous or villous-woolly on the back. *Receptacle* small, nude. *Marginal florets* female, 1-3 fertile. *Corolla* filiform, or tubular and slender. *Disc florets* bisexual, few, sterile. *Corolla* tubular, with the limb widened or narrowly campanulate, 5-toothed. *Anthers* sagittate at the base. *Style* of the bisexual florets undivided or

very shortly 2-lobed. *Achenes* of the female florets sub-terete, papillose, pubescent, or woolly; of the bisexual florets, empty, glabrous. *Pappus bristles* in 1 row, barbellate, often short; of the female florets sometimes very short.

Small shrubs or undershrubs; leaves alternate, entire, sometimes with revolute margins; heads small, in dense cymose-corymbs at the apices of the branches.

Endemic; species 7, found in the south-western districts.

9000

53. HELIPTERUM, DC.

Heads homogamous, many- or 2 to few-flowered, all the florets bisexual and fertile, or the inner sterile, or rarely heads heterogamous with a few marginal female florets. *Involucre* hemispherical, campanulate, ovoid, or cylindric; bracts in many series, imbricate, scarious at the base, coloured or sub-petaloid, or the limb coloured and erect or appendiculate and spreading. *Receptacle* flat, convex, or somewhat conical, nude, honeycombed, or pitted, or rarely with a few paleae between the sterile florets. *Corolla* of female marginal florets (when present) filiform, 3-4-toothed. *Corolla* of bisexual florets tubular, with the limb sometimes slightly widened, sometimes distinctly campanulate, 5-fid. *Anthers* sagittate at the base. *Style-branches* sub-terete, truncate or sub-capitate at the apex. *Achenes* papillose or silky-villous. *Pappus bristles* in 1 row, plumose from the base, sometimes naked at the apex, free or more or less united.

Annual or perennial herbs, or rarely shrubs, cano-tomentose, sub-woolly, or glabrescent; leaves alternate, or rarely the lowest leaves opposite; heads large to small or very small, solitary, corymbose or panicle at the apices of the branches; involucre white, yellow, or pink, rarely brown or pallid.

An African and Australian genus of about 59 species; 15 species in South Africa, found in the coastal belt from Clanwilliam to Albany; also recorded from Matjesfontein.

9002

54. ERIOSPHAERA, Less.

Heads homogamous, with bisexual fertile florets. *False involucre* ovoid?; bracts in a few series, linear, woolly. *True receptacle* small, nude. *Corolla* slender, tubular, 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* truncate and penicillate. *Achenes* small, papillcse-granular. *Pappus bristles* few, beaded towards the apex.

A prostrate annual herb, cobwebby; leaves alternate; heads aggregated into sessile glomerules, each glomerule surrounded by several floral leaves similar in shape and size to the cauline but more woolly.

Endemic; species 1, found in the Cape, Prince Albert, Fauresmith, and Komgha districts; also found in Namaqualand.

9003

55. STENOCLINE, DC.

Heads homogamous, discoid, with few (1-6) fertile bisexual florets, or rarely heads heterogamous with 1-2 marginal female flowers. *Involucre* narrow; bracts in a few series, laxly imbricate, slightly unequal, scarious, coloured, rigid below; the outer shorter, woolly on the back at the base. *Receptacle* small, nude. *Corolla* of female florets, when present, filiform. *Corolla* of bisexual florets slender, tubular, with the limb scarcely widened, 5-toothed. *Anthers* sagittate at the base. *Style-branches* slender, truncate at the apex. *Achenes* terete, 8-10-ribbed or 5-angled, glabrous or shortly pilose. *Pappus bristles* slender, in 1 row, often dilated or barbellate at the apex, free, caducous leaving a scar.

Perennial herbs, erect, often woody at the base, cano-tomentose or woolly, leaves alternate, sessile; heads small, densely cymose, with the cymes in a corymbose panicle.

Species 13, natives of Madagascar, Brazil, and South Africa; 1 species recorded from S. W. Africa.

9006

56. *HELICHRYSUM*, Gaertn.

Heads homogamous or heterogamous; the marginal florets few or in 2-3 rows, but fewer than the bisexual florets, the rest or all bisexual and fertile, or rarely the innermost sterile. *Involucre* hemispherical, campanulate, globose, ovoid, or cylindric; bracts in many series, various. *Receptacle* flat, convex, or rarely almost conical, nude, with long paleae, pitted, or honeycombed, with the margins of the pits produced into persistent bristles or paleae, about as long as the achenes. *Corolla* of female florets (when present) filiform, minutely toothed. *Corolla* of bisexual florets tubular, with the limb slightly widened, 5- (rarely 4-) toothed. *Anthers* sagittate at the base. *Style-branches* sub-terete, truncate or sub-capitate. *Achenes* small, 5-angled, terete or scarcely compressed, glabrous, papillose, or rarely silky-villous. *Pappus bristles* many, in 1 row, very rarely in many rows, slender or shortly dilated, barbellate or sub-plumose at the apex, never plumose to the base, free, or variously connate at the base.

Herbs, undershrubs, or shrubs, of various habit, often cano-tomentose or woolly; leaves alternate or very rarely the lower opposite, entire; heads large, medium-sized, or small, with few to many florets, solitary or corymbose at the apex of the branches, rarely sessile and axillary or glomerate.

Species about 500, mostly found in South Africa, the Mascarene Islands, and Australia; also found in tropical Africa, Europe, and a few in east India; 226 species in South Africa, widely distributed.

9008

57. *LEONTONYX*, Cass.

Heads heterogamous, discoid. *Involucre* ovoid; bracts in a few series, imbricate, woolly on the back. *Receptacle* small, nude. *Marginal florets* few or many, in 1 row, female. *Corolla* filiform, minutely toothed at the apex or expanded into a small 3-5-fid limb. *Disc florets* numerous, fertile, bisexual. *Corolla* tubular, with the limb slightly widened, 5-fid. *Anthers* sagittate at the base. *Style-branches* slender, truncate. *Achenes* oblong, 4-5-angled, glabrous. *Pappus bristles* copious, in many rows, very slender, sometimes denticulate above, caducous leaving a scar.

Low herbs or undershrubs, densely cano-tomentose or woolly; leaves alternate, entire, often spatulate; heads small, sub-sessile, aggregated in dense woolly terminal cymes.

Endemic; species 8, found in the coastal belt from Namaqualand to Natal and extending into the northern Transvaal; recorded also from Murraysburg.

9010

58. *PACHYRHYNCHUS*, DC.

Heads homogamous, discoid, with all the florets bisexual and fertile. *Involucre* terete-oblong; the inner bracts elongated, scariosus, shining, acute, at length spreading; the outer shorter, foliaceous, cano-villous. *Receptacle* flat, nude. *Corolla* tubular, 5-toothed. *Anthers* and *style* unknown. *Achenes* ovate, villous. *Pappus bristles* in many rows, scarcely scabrid, longer than the corolla.

Shrub, villous-tomentose; leaves alternate, sessile, callous-apiculate at the apex.

Endemic; species 1, locality uncertain.

9019

59. HUMEA, Sm.

Heads homogamous, discoid, with 1-4 florets all bisexual and fertile. *Involucre* oblong in outline; bracts in a few rows, imbricate, scarious, coloured, or petaloid, adpressed; the outer shorter. *Receptacle* small, nude. *Corolla* tubular, with the limb slightly expanded or narrowly campanulate. *Anthers* sagittate at the base. *Style-branches* truncate. *Achenes* narrow, oblong or sub-fusiform, glabrous or glandular-papillose. *Pappus* 0.

Small diffuse tomentose-woolly herbs; leaves alternate, small, linear; heads sessile, small, solitary and sub-globose, or a few massed in globose glomerules, or in corymbs, woolly.

Species 13, natives of Australia and Africa; one species found in south-east Africa.

9037

60. STOEBE, Linn.

Heads with 1 bisexual fertile floret. *Involucre* oblong; bracts few, imbricate; the inner rigid, scarious, acute; the outer smaller, often tomentose on the back. *Receptacle* small, nude. *Corolla* tubular, or the limb slightly widened, shortly 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* narrow, truncate at the apex, often penicillate. *Achenes* oblong in outline, sub-terete, ribbed, glabrous, or villous especially on the ribs. *Pappus* bristles in one row, plumose, connate into a ring at the base, or rarely free and caducous leaving a scar.

Rigid shrubs, tomentose or glabrous; leaves alternate, small, ericoid, often fasciated; heads small or very small, arranged in oblong or globose glomerules at the apices of the branches, or sessile in the axils of the upper leaves.

Species 29, natives of Africa and Madagascar, one species in the Island of Bourbon; 24 species in South Africa, mostly massed in the south-western districts, but extend eastwards into Natal, Basutoland, and the Transvaal.

9038

61. PEROTRICHE, Cass.

Heads with 1 bisexual fertile floret. *Involucre* oblong in outline; bracts few, scarious; the inner rigid, acute; the outer slightly smaller. *Receptacle* small, nude. *Corolla* sub-equally tubular, or the limb slightly widened, 5-fid at the apex. *Anthers* sub-sagittate at the base. *Style-branches* narrow, truncate-sub-capitate at the apex, sub-penicillate. *Achenes* oblong in outline, sub-terete, 5-angled, obtuse, glabrous. *Pappus* 0.

Shrubs, cano-tomentose or glabrous, with the habit of a *Stoebe*; leaves small, ericoid, twisted; heads small, numerous, in terminal solitary globose glomerules.

Endemic; species 2, found in the south-western districts.

9039

62. DISPARAGO, Gaertn.

Heads heterogamous, 2-flowered and radiate, or 1-flowered and unisexual; female floret fertile or sterile; bisexual floret fertile. *Involucre* oblong in outline; bracts few, imbricate, rigid, scarious, acute; the outer shorter. *Receptacle* small, nude. *Corolla* of the female floret ligulate, with the lamina entire or toothed, sometimes minute. *Corolla* of bisexual floret tubular, with the limb slightly widened, 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* slender, truncate and penicillate at the apex. *Achenes* oblong in outline, ribbed, glabrous or villous. *Pappus* bristles 5 to many, plumose, slightly connate at the base, or in the sterile achenes of few bristles or none.

Shrubs with the habit of a *Stoebe*; leaves small, ericoid, twisted; heads small, arranged in terminal globose glomerules.

Endemic; species 8, extending from the south-western into the eastern districts.

9041

63. ELYTROPAPPUS, Cass.

Heads homogamous, 3 to many-flowered, discoid, with all the florets bisexual and fertile. *Involucre* oblong in outline or narrowly campanulate; bracts in a few series, imbricate, scarious, often acute; the outer shorter, sometimes tomentose on the back, rarely foliaceous. *Receptacle* small, nude. *Corolla* tubular, with the limb elongated, slightly widened, 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* sub-terete, truncate at the apex. *Achenes* oblong, ribbed, glabrous. *Pappus* bristles in one row, plumose, connate at the base into a ring.

Shrubs, setoso-hispid, glandular-scabrid, or finely tomentose; leaves alternate, small, ericoid, often twisted and tomentose above; heads small, sometimes in glomerules at the apices of the branches, sometimes sub-fascicled in the axils of the leaves forming spikes.

Endemic: species 7, mostly in the south-western districts; one species widely spread in the central districts, and in the coastal districts to Albany.

9042

64. PTEROTHRIX, DC.

Heads homogamous, 3-10-flowered, discoid, with all the florets bisexual and fertile. *Involucre* cylindric; bracts in a few series, imbricate, rigidly scarious, acute; the outer gradually smaller and sub-tomentose without. *Receptacle* small, nude. *Corolla* tubular, with the limb elongated and slightly widened, 5-fid at the apex. *Anthers* scarcely sagittate at the base. *Style-branches* narrow, broader above, truncate. *Achenes* oblong in outline, sub-terete, with the margin at the apex produced into a small prominent ring surrounding the pappus, glabrous. *Pappus* bristles copious, in 1 row, free, or scarcely connate at the base, plumose.

Ericoid shrubs, tomentose or glabrous, branchlets here and there abortive and spinescent, or unarmed; leaves small, rigid, concave above, or involute, often twisted; heads narrow, sessile at the apex of the branches or in the upper leaf-axils.

Endemic; species 3, found in the central and north-western districts; also in the western O.F.S.

9043

65. METALASIA, R.Br.

Heads homogamous, discoid, few- or many-flowered, with the florets all bisexual and fertile, or a few sterile. *Involucre* cylindric or turbinate-campanulate; bracts in many series, imbricate; the inner rarely almost all coloured at the apex, or with a radiating appendiculate coloured limb; the outer gradually smaller, adpressed, often woolly on the back. *Receptacle* flat, nude, sometimes with long linear paleae. *Corolla* tubular, with the limb slightly widened, 5-toothed. *Anthers* sagittate at the base. *Style-branches* slender, obtuse or truncate at the apex. *Achenes* in the few-flowered heads only 1, in the many-flowered heads almost all perfect, slightly compressed, without ribs, or 5-angled, glabrous, often shining. *Pappus* bristles in 1 row, free, caducous leaving a scar, slender, or thickened towards the apex.

Erect or divaricate ericoid shrubs; branches often cano-tomentose; leaves small, sessile, entire, coriaceous, short, usually somewhat twisted, with the margins often incurved; heads small or medium-sized, crowded at the apices of the branchlets, sessile or sub-umbellate, rarely solitary.

Endemic; species 24, mostly massed in the south-western districts; 1 species extends eastwards into Natal.

9045

66. LACHNOSPERMUM, Willd.

Heads homogamous, discoid, many-flowered, with all the flowers bisexual and fertile. *Involucre* turbinate-campanulate; bracts in many series, imbricate, rigidly scarious, mucronate-acute, erect; the outer gradually smaller. *Receptacle* flat, covered with a few very narrow linear paleae placed between the outer florets. *Corolla* slender, tubular, with a slightly widened limb, 5-toothed. *Anthers* sagittate at the base. *Style-branches* slender, truncate at the apex. *Achenes* oblong in outline, with the 4 angles prominently ciliate-villous. *Pappus* bristles copious, scabrid, sub-2-seriate, slightly sub-connate at the base.

A shrub, slightly cano-tomentose; leaves alternate, small, sub-twisted, fascicled; heads medium-sized, solitary at the apices of the branches, or 2-3-nate.

Endemic; species 1, recorded from Paarl and Namaqualand.

9046

67. AMPHIGLOSSA, DC.

Heads heterogamous, radiate. *Involucre* cylindric; bracts in many series, imbricate, rigidly scarious; the outer gradually smaller, often tomentose on the back. *Receptacle* small, nude. *Ray florets* in 1 row, female, sometimes very few. *Corolla* ligulate, with the lip small and shorter than the involucre. *Disc florets* bisexual, fertile. *Corolla* slender, tubular, with the limb scarcely widened, 5-toothed. *Anthers* sub-sagittate at the base. *Style-branches* slender, truncate at the apex. *Achenes* oblong, glabrous. *Pappus* bristles copious, in 1 row, plumose, caducous leaving a sear.

Rigid shrubs, with the branches occasionally spinescent; leaves small, rigid, concave and tomentose above; heads small, terminal and sessile on the axillary branchlets.

Endemic; species 5, extending from Namaqualand to the Uitenhage district.

9047

68. BRYOMORPHE, Harv.

Heads heterogamous, radiate. *Involucre* ovoid; bracts in a few series, imbricate, adpressed, rigidly scarious; the outer shorter or the outermost passing into the leaves. *Receptacle* somewhat convex, nude. *Ray florets* in 1 row, female. *Corolla* ligulate, with the lamina shortly 3-toothed. *Disc florets* bisexual, fertile. *Corolla* tubular, with the limb slightly widened and shortly 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* of the female flowers slender, truncate at the apex. *Achenes* narrowly oblong, glabrous. *Pappus* bristles slender, 1-seriate, scabrid, free, caducous leaving a sear.

A moss-like plant, forming cushion-shaped growths; leaves densely imbricate, linear, concave and tomentose above; heads small, sessile in the axils of the upper leaves.

Endemic; species 1, found in the south-western districts.

9048

69. NESTLERA, Spreng.

Heads heterogamous, radiate. *Involucre* ovoid or campanulate; bracts in many series, imbricate, rigidly scarious, or coriaceous at the base, erect; the outer gradually smaller, adpressed. *Receptacle* almost flat, honey-combed or with the margins of the pits here and there produced into bristles or setæ. *Ray florets* in 1 row, female. *Corolla* ligulate, spreading, entire or minutely toothed at the apex. *Disc florets* bisexual, fertile. *Corolla* tubular, with the limb widened and elongated or sub-campanulate, 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* narrow, truncate.

Achenes elongated, sub-terete, striate or angular, glabrous or pilose. *Pappus* of many short distinct paleæ, or more or less united into a toothed cup.

Erect or prostrate herbs or shrubs, glabrous or cano-tomentulose, sometimes glutinous; leaves alternate or opposite, linear, entire, often channelled or concave above; heads small or medium-sized, solitary, terminal or sessile in the forks of the branches, or very shortly peduncled; florets yellow.

Endemic; species 13, mostly in the central and north-western districts; also recorded from the south-eastern districts, Uitenhage, the O.F.S., Basutoland, Natal, and S.W. Africa.

9049

70. ANAGLYPHA, DC.

Heads heterogamous, radiate. *Involucre* broadly campanulate; bracts in a few series, imbricate, acute; the inner lanceolate, with a scarios margin and hispidulous on the back; the outer linear-subulate, shorter. *Receptacle* flat, nude. *Ray florets* in 1 row, female. *Corolla* ligulate, with the lamina spreading, minutely 3-toothed at the apex. *Disc florets* bisexual, fertile. *Corolla* tubular, with a widened limb, semi-5-fid. *Anthers* sagittate at the base. *Style-branches* truncate at the apex. *Achenes* (immature) sub-terete, 5-ribbed, glabrous. *Pappus* 0.

Shrubs, covered with short rigid hairs; leaves alternate, linear, rigidly mucronate-acute, channelled above, or with the margins slightly incurved, keeled on the back, or at length sub-terete; heads peduncled, solitary at the apex of the branches.

Endemic; species 2, recorded from between the Coega and Zwartkops Rivers.

9050

71. RELHANIA, L'Her.

Heads heterogamous, radiate, or rarely with the rays absent and then homogamous. *Involucre* oblong in outline, ovoid or campanulate; bracts in many series, imbricate, rigidly coriaceous, or erect-adpressed and scarios at the apex, or the inner sub-spreading at the apex; the outer gradually smaller. *Receptacle* flat, covered with distinct often persistent paleæ. *Ray florets* female. *Corolla* ligulate, spreading, or often hardly exceeding the disc. *Disc florets* bisexual, fertile. *Corolla* tubular, with a cylindric limb, scarcely widened, 5-toothed. *Anthers* sagittate at the base. *Style-branches* narrow, somewhat flattened, obtuse or truncate at the apex. *Achenes* linear, angled, or in the female florets dorsally compressed, glabrous, ciliate on the angles, or rarely sparsely hairy. *Pappus* of many short distinct paleæ, or paleæ united into a lacerated or toothed cup.

Shrubs, often glutinous, or annual herbs, glabrous or finely canescent; leaves alternate or rarely opposite; heads medium sized or large, solitary at the apex of the branches, sometimes solitary in the forks of the branches, or few in a terminal corymb.

Endemic; species 20, mostly in the coastal belt from Namaqualand to Natal; also recorded from Basutoland and Vryburg.

9051

72. ROSENIA, Thunb.

Heads heterogamous, with a single row of female marginal florets. *Involucre* cylindric-campanulate; bracts in many series, imbricate, with the margins broadly scarios, obtuse, or the inner acute; the outer gradually smaller. *Receptacle* covered with folded paleæ encircling the florets. *Corolla* of marginal florets not known. *Disc florets* bisexual, fertile. *Corolla* tubular, with a cylindric 5-toothed limb. *Anthers* tailed at the base. *Style-branches* narrow, truncate. *Achenes* beakless; those of female florets prismatic; those of bisexual florets cylindric, glabrous. *Pappus* of paleæ;

of the female florets simple ; of the bisexual florets double, the inner consisting of 2 long bristles.

Glabrous shrubs ; leaves small, decussate, albo-tomentose above, with inflexed margins ; heads terminal, solitary.

Endemic ; species 2, found in the Karroo.

9052

73. LEYSSERA, Linn.

Heads heterogamous, radiate. *Involucre* turbinate or campanulate ; bracts in many series, imbricate, scarious, with the apex hyaline or rigid ; the outer gradually smaller. *Receptacle* flat, nude, or with lacerated paleae arranged round the female florets. *Ray florets* female, in 1 row. *Corolla* ligulate, with a spreading narrow entire or scarcely toothed limb. *Disc florets* bisexual, fertile, slender, tubular, with the limb scarcely broadened, shortly 5-fid. *Anthers* sagittate at the base. *Style-branches* narrow, obtuse. *Achenes* narrow, angular, glabrous or often with a villous basal callus. *Pappus* of the female florets of short scales ; of the bisexual florets of long plumose bristles, alternating with small scales.

Herbs or undershrubs, cano-tomentose or almost glabrous ; leaves alternate, narrow, linear or subulate ; heads solitary, medium-sized, long-peduncled.

An African genus of 7 species ; 4 species in South Africa, extending from S.W. Africa to the Cape and Uitenhage ; also found in some of the north-western districts.

9053

74. MACOWANIA, Oliv.

Heads heterogamous, radiate. *Involucre* broadly campanulate ; bracts in many series, imbricate, obtuse and scarious at the apex ; the outer gradually smaller, dorsally pubescent. *Receptacle* flat, sub-honeycombed. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, spreading, entire. *Disc florets* bisexual, sterile. *Corolla* tubular, with a campanulate 5-fid limb. *Anthers* sagittate at the base. *Style-branches* short, truncate. *Achenes* of ray florets elongated, sub-terete, striate, slightly pubescent ; of the disc florets linear, empty. *Pappus* of a few short bristles in 1 row, caducous leaving a scar.

Shrubs ; leaves alternate ; heads large, solitary at the apex of the branches and arranged in a leafy corymb.

Endemic ; species 3, found in the eastern districts, Natal, and the mountains at Barkly East.

9055

75. ATRIXIA, Ker

Heads heterogamous, radiate or sub-discoid. *Involucre* turbinate, campanulate, or hemispherical ; bracts in many series, narrow, subulate, acuminate, often squarrose ; the outer gradually smaller. *Receptacle* flat, nude. *Marginal florets* in 1 row, sometimes few, female. *Corolla* sometimes ligulate, with a spreading elongated lamina, sometimes scarcely ligulate, with a small erect oblique limb. *Disc florets* bisexual, fertile. *Corolla* slender, tubular, with the limb small or scarcely widened, 5-toothed. *Anthers* sagittate at the base. *Style-branches* narrow, semi-terete or flattened, obtuse or truncate. *Achenes* oblong in outline, ribbed, glabrous or villous. *Pappus* bristles in 1 row, scabrid, or barbellate, or plumose in the uppermost portion, sometimes mixed with short simple bristles.

Erect herbs or undershrubs ; leaves alternate, with the margins revolute or recurved, tomentose beneath ; heads of medium size or large, solitary at the apex of the branches, or sometimes grouped into a lax leafy corymb.

Species about 28, found in Africa, Madagascar, and Australia ; 11 species in South Africa, extending from the Transvaal, Natal, Basutoland, and the eastern O.F.S., through the coastal districts to Caledon.

9056

76. ANTITHRIXIA, DC.

Heads heterogamous, radiate. *Involucre* narrowly campanulate; bracts in many series, imbricate, adpressed, rigidly scarious; the outer gradually smaller. *Receptacle* flat, nude. *Ray florets* in 1 row, female. *Corolla* ligulate, spreading. *Disc florets* bisexual, fertile. *Corolla* slender, tubular, with the limb scarcely widened, shortly 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* elongated, obtuse, sub-truncate. *Achenes* terete, glabrous or villous. *Pappus* bristles copious, sub-2-seriate, unequal, scabrid, free or scarcely cohering at the base.

Small shrubs, cano-tomentose; leaves opposite or alternate; heads of medium size, solitary at the apex of the branches.

An African genus of 3 species; 1 species recorded from Namaqualand.

9057

77. HETEROLEPIS, Cass.

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in many series, imbricate; the inner broadly scarious at the apex; the outer narrow and sub-herbaceous. *Receptacle* almost flat, honeycombed. *Ray florets* in 1 row, female. *Corolla* ligulate, with a spreading sub-entire limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with the limb slightly widened, deeply 5-fid. *Anthers* sagittate at the base. *Style-branches* linear, obtuse or almost obtuse, often more or less flattened. *Achenes* oblong in outline, equally 10-ribbed, densely villous. *Pappus* bristles sub-2-seriate, rigid, unequal, sub-plumose.

Shrubs, canescent or glabrescent; leaves alternate, often crowded, narrowly linear; heads large, peduncled, solitary at the end of the branches.

Endemic; species 3, all south-western, but extending to the Uitenhage district; also recorded from the Karroo.

9058

78. ARROWSMITHIA, DC.

Heads heterogamous, radiate. *Involucre* campanulate; bracts in many series, imbricate, rigidly scarious, sub-coriaceous, adpressed or loose at the apex; the outer gradually smaller. *Receptacle* flat, covered with long rigid caducous bristles amongst the florets. *Ray florets* female, fertile. *Corolla* ligulate, spreading, woolly without. *Disc florets* bisexual, sterile (or the outermost fertile?). *Corolla* tubular, with a 5-fid slightly widened limb, woolly without. *Anthers* sub-sagittate at the base. *Style-branches* obtuse, or style undivided in the disc florets. *Achenes* narrow, compressed, glabrous. *Pappus* 0.

A shrub, sub-glabrous or minutely cano-tomentose; leaves alternate, pungent-mucronate; heads sessile and solitary at the apex of the branches, or a few grouped together.

Endemic; species 1, recorded from the Katberg and Kingwilliamstown.

9059

79. PRINTZIA, Cass.

Heads heterogamous, radiate. *Involucre* campanulate or sub-hemispherical; bracts in many rows, imbricate, rigid; the inner elongated; the outer gradually smaller, often tomentose without. *Receptacle* flat or somewhat convex, nude. *Ray florets* female, in 1 row. *Corolla* ligulate with a spreading entire or minutely 2-3-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular with a slightly widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* linear, flattened, obtuse. *Achenes* oblong in outline, 5-ribbed, villous or papillose-pubescent. *Pappus* bristles in many rows, barbellate, or sub-plumose, rarely scarcely scabrid; the outer often shorter and slender.

Shrubs, tomentose or scabrid-pubescent; leaves alternate, often small and numerous; heads medium-sized, sessile or peduncled at the apex of the branches.

Endemic; species 7, extending from the Cape, through the coastal districts to Natal; also recorded from Basutoland and the O.F.S.

9061

80. INULA, Linn.

(Including *Monactinocephalus*, Klatt & *Pentatrichia*, Klatt)

Heads heterogamous, radiate, or rarely discoid. *Involucre* hemispherical, campanulate, or rarely ovoid; bracts in many series, imbricate; the innermost often narrow and scarious; the outer dry or herbaceous, narrow or broad, gradually smaller, or the outermost foliaceous. *Receptacle* flat or somewhat convex, marked or pitted. *Ray florets* female, in 1 to many rows. *Corolla* ligulate, 3-toothed, sometimes elongated and spreading, sometimes shorter than its own style and erect with a small oblique 2-3-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with the limb slightly widened and 5-toothed or 5-fid. *Anthers* sagittate at the base. *Style-branches* linear, slightly flattened, often broad near the apex, obtuse, very shortly papillose on the back. *Achenes* sub-terete, conspicuously or inconspicuously 5-ribbed, glabrous or silky-pilose. *Pappus* bristles sometimes few, sometimes copious, in 1 to many rows, sub-equal, scabrid or barbellate.

Herbs, often perennial, rarely shrubs, glandular-scabrid, pubescent, villous, or tomentose; leaves alternate, sometimes radical; heads large, medium-sized, or small, solitary at the apex of the branches, or often in corymbs or panicles, or crowded on the stem.

Species about 119, found in Europe, Asia, and Africa; 2 species in South Africa, recorded from the Cape, Natal, and the Transvaal.

9061a

81. BOJERIA, DC.

Heads homogamous, discoid, all the florets bisexual and fertile, rarely heterogamous with marginal female florets. *Involucre* hemispherical; bracts in a few series, acuminate; the inner sub-scarious; the outer shorter, lanceolate, herbaceous. *Receptacle* flat, sub-pitted. *Corolla* tubular, with the limb a little widened and 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* linear, sub-flattened, broadened above, rounded at the apex. *Achenes* sub-terete, 10-20-ribbed, glabrous. *Pappus* bristles moderately copious, scabrid, a little unequal, or 0.

Erect perennial herbs, glandular-puberulous or villous; leaves alternate; the upper cordate-amplexicaul; heads large, peduncled at the ends of the branches.

Species 3; 1 species found in Madagascar; 2 species found in Natal and the Transvaal.

9062

82. HOMOGAETE, Benth.

Heads heterogamous, radiate. *Involucre* ovoid-cylindric; bracts in many series, imbricate, dry, sub-coriaceous; the inner narrow, elongated; the outer gradually smaller, obtuse, with glutinous margins. *Receptacle* flat, nude or slightly pitted. *Ray florets* female. *Corolla* ligulate, with a long narrow tube and the limb spreading and sub-entire. *Disc florets* bisexual, fertile. *Corolla* with a little widened limb, 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* linear, rounded or obtuse at the apex. *Achenes* oblong in outline, sub-terete, 6-10-ribbed, papillose-puberulous. *Pappus* bristles in 1 row, rigid, very shortly ciliate-barbellate, more or less connate at the base.

A densely leafy shrub, glandular-pubescent; leaves alternate, crowded, linear, with revolute margins; heads terminal, solitary, sessile among the upper leaves.

Endemic; species 1, recorded from British Kaffraria.

9064

83. MINUROTHAMNUS, DC.

Heads heterogamous, radiate. *Involucral bracts* in 2 series; the outer smaller, acuminate; the inner longer, obtuse, with a sub-membranous margin. *Receptacle* not seen. *Ray florets* female, in 1 row. *Corolla* not seen. *Disc florets* bisexual, fertile. *Corolla* not seen. *Anthers* shortly 2-tailed at the base. *Style-branches* spreading. *Achenes* albo-villous. *Pappus* bristles 20, in 2 rows; the outer 10 slightly smaller.

An undershrub; leaves alternate, adpressed-tomentose beneath; heads solitary at the apex of a naked branch.

Endemic; species 1, recorded from the Caledon district.

9065

84. IPHIONA, Cass.

Heads homogamous, discoid, with all the florets bisexual and fertile, rarely radiate. *Involucre* campanulate or ovoid; bracts in many series, imbricate, dry, or the inner rigid and scarious or ciliate on either side; the outer gradually smaller and at length sub-herbaceous. *Receptacle* sub-honeycombed. *Corolla* tubular, with an elongated limb somewhat widened and 5-fid at the apex. *Anthers* sagittate at the base. *Style-branches* flattened, obtuse. *Achenes* almost terete, 8-10-ribbed, glabrous or villous. *Pappus* bristles copious, in 2 to many rows.

Glabrous or sparingly hairy shrubs; leaves alternate; heads medium-sized or small, solitary at the apices of the branches, or pedunculate in the upper leaf-axils, often produced into leafy panicles, rarely sub-corymbose.

Species 17, found in Arabia, central Asia, Africa, the Mediterranean Region, and the Mascarene Islands; 4 species in South Africa, found in the central and north-western districts: also recorded from the Montagu, Uitenhage, and Albany districts.

9067

85. CYPSELODONTIA, DC.

Heads heterogamous, radiate. *Involucral bracts* in many rows, imbricate, linear; the outer squarrose. *Receptacle* honeycombed, with the margins of the pits toothed. *Ray florets* neuter. *Corolla* not seen. *Disc florets* bisexual, fertile. *Corolla* not seen. *Anthers* sagittate at the base. *Style-branches* obtuse. *Achenes* of ray florets, empty, glabrous, surrounded at the base with a ring of hairs; of the disc florets villous. *Pappus* of ray florets a few bristles; of disc florets copious.

A branched undershrub, with few leaves; leaves alternate, canescent-villous beneath, 1-nerved; heads solitary at the end of the branches.

Endemic; species 1, recorded from the Uitenhage district.

9068

86. ANISOCHAETA, DC.

Heads homogamous, discoid, with the florets all bisexual and fertile. *Involucre* ovoid or sub-globose; bracts in many series, imbricate, acute, dry; the outer gradually smaller. *Receptacle* convex, nude. *Corolla-tube* slender, with a narrow 5-partite limb. *Anthers* sagittate at the base. *Style-branches* linear or sub-cuneate, flattened, obtuse at the apex. *Achenes* (immature) angled, glabrous. *Pappus* of many paleae; paleae short, unequal, very acute, almost aristate.

A sub-scandent shrub; leaves alternate, petioled, deeply incised-toothed; heads small, peduncled, arranged in lax panicles.

Endemic; species 1, found in Natal and the Transkei.

9069

87. CALOSTEPHANE, Benth.

Heads heterogamous, radiate. *Involucre* sub-hemispherical; bracts sub-2-seriate, a little unequal, herbaceous, linear-subulate, very acute, hispidulus. *Receptacle* convex, pitted. *Ray florets* in 1 row, female. *Corolla* ligulate, with a spreading 3-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with a slightly widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* long, linear, acute. *Achenes* oblong in outline, sub-terete, 10-ribbed, villous. *Pappus* of 5 broad hyaline slightly toothed paleae, alternating with 5 sub-barbellate paleaceous bristles.

Pubescent herbs; leaves alternate, decurrent; head solitary, long-peduncled.

An African genus of 4 species; 3 species found in S.W. Africa.

9072

88. ANISOTHRIX, O.Hoffm.

Heads homogamous, with all the florets bisexual and fertile. *Involucre* hemispherical; bracts in many rows, imbricate. *Receptacle* flat, nude. *Corolla* with a narrow cylindric 5-toothed limb. *Anthers* tailed. *Style-branches* linear, obtuse. *Achenes* cylindric, truncate, silky. *Pappus* double; the outer of 10 short bristles; the inner of 5 elongated bristles.

A glabrous shrub; leaves small, pinnatifid; heads large, solitary at the apex of the branches.

Endemic: species 1, recorded from the Montagu district.

9073

89. PEGOLETTIA, Cass.

Heads homogamous, discoid, with all the florets bisexual and fertile. *Involucre* campanulate or sub-hemispherical; bracts in a few series, narrow, sub-herbaceous or with scarious margins; the outer slightly shorter. *Receptacle* convex, pitted. *Corolla* tubular, with an elongated slightly widened 5-fid limb, often 4 lobes cohering high up and the fifth lobe deeply cut and solitary producing a bi-labiate limb. *Anthers* sagittate at the base. *Style-branches* flattened above, obtuse. *Achenes* elongated, terete, 10-ribbed, pilose. *Pappus* double; the outer of short free narrow cut-paleae; the inner of long copious bristles, barbellate or plumose.

Erect pubescent herbs; leaves alternate; heads large or small, solitary at the apex of the branches, or laxly panicle.

An African genus of 4 species; 3 species in South Africa, found in the Transvaal, S.W. Africa, the O.F.S., and the north-western districts.

9078

90. PULICARIA, Gaertn.

Heads heterogamous, radiate or discoid. *Involucre* hemispherical; bracts in a few series, narrow, acuminate; the inner often scarious; the outer shorter, herbaceous or rarely foliaceous. *Receptacle* flat or convex, more or less distinctly pitted. *Marginal florets* female, in 1-2-rows. *Corolla* ligulate, narrow, spreading, or rarely filiform with a minute erect oblique 2-3-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular, slender, with an elongated slightly widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* linear, slightly flattened, a little broadened at the apices, obtuse. *Achenes* terete or prominently ribbed, glabrous or pilose. *Pappus* double; the outer of very short paleae, more or less connate into a small lacerated cup; the inner of few or many scabrid or barbellate bristles, often caducous.

Annual or perennial herbs, villous or sub-woolly, or rarely glabrate; leaves alternate, often cordate-amplexicaul, entire, undulate, or sinuate-dentate; heads: medium-sized or small, rarely large, solitary at the apex of the branches.

Species about 41, found in Europe, Asia, and Africa, with a few species in the Mediterranean Region; 2 species in South Africa, found in the coastal belt from the Cape to S.W. Africa, and eastwards to Natal and the Transvaal.

9083

91. PHILYROPHYLLUM, O.Hoffm.

Heads heterogamous, radiate. *Involucre* shortly campanulate; bracts in many series, membranous, sub-equal. *Receptacle* shortly conical, paleaceous, nude in the centre. *Corolla* of ray florets ligulate, 3-toothed. *Corolla* of disc florets 5-toothed. *Anthers* tailed. *Style-branches* obtuse. *Achenes* 10-ribbed, pilose. *Pappus* of ray florets minutely coroniform, of many unequal lacerated paleae; pappus of disc florets double; the outer similar to that of the ray florets; the inner of bristles.

A glandular-pubescent shrub; leaves alternate, toothed or twice-toothed; heads small or medium-sized, a few at the apex of the branches.

Endemic; species 1, recorded from the western Kalahari and the northern Transvaal.

9088

92. EENIA, Hiern & S.Moore

Heads homogamous, discoid, with all the florets bisexual and fertile. *Involucre* broadly campanulate; bracts in a few series, narrow; the outer smaller. *Receptacle* slightly raised, honeycombed, covered with membranous concave deciduous paleae clasping the florets singly. *Corolla* with a 5-lobed widened limb. *Anthers* sagittate at the base. *Style-branches* slightly flattened, linear, obtuse, not truncate. *Achenes* (immature) terete. *Pappus* simple, of 5 short paleae forming a variously lacerated cup.

Undershrub, minutely tomentose, at length glabrous; leaves alternate, sessile, very often 3-lobed; heads small, arranged in corymbs.

Endemic; species 1, recorded from S. W. Africa.

9090

93. GEIGERIA, Griessel.

Heads heterogamous, radiate. *Involucre* ovoid, at length often globose; bracts in many series, rigid, acuminate; outer shorter. *Receptacle* flat, covered with narrow paleae, sometimes with almost long copious bristles; bristles very dense between the florets, joined round the achene in wide lacerated paleae. *Ray florets* female, in one row. *Corolla* ligulate, spreading, 3-toothed. *Disc florets* bisexual, fertile. *Corolla* tubular, with a scarcely widened elongated limb almost 5-fid to the base, more rarely only divided half way. *Anthers* sagittate at the base. *Style-branches* long, linear-lanceolate or linear, flattened, obtuse. *Achenes* 3-4-angled, pilose or silky-villous. *Pappus* of hyaline paleae, often in 2 rows; the outer short, acute or mucous; the inner often aristate-acuminate, rarely absent.

Low herbs or undershrubs; leaves alternate, often glandular-punctate; heads medium-sized or small, sessile, terminal in the forks of the branches, or secondly pseudo-lateral on lengthening branches.

An African genus of about 20 species; about 10 species recorded from South Africa, found in the central and north-western districts, the O.F.S., Natal, the Transvaal and S. W. Africa. (The genus is under revision at time of publication and contains more species than indicated above).

9094

94. CALLILEPIS, DC.

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in a few series, a little unequal, narrow, acute, sub-herbaceous, rigid. *Receptacle* convex or conical, covered with rigid folded paleae surrounding the bisexual florets. *Ray florets* female, in 1 row. *Corolla* ligulate, with a spreading

entire or scarcely 2-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with a narrow campanulate deeply 5-fid limb. *Anthers* sagittate at the base. *Style-branches* linear, wide, rounded at the apex. *Achenes* glabrous; of the ray florets 3-sided; of the disc florets laterally compressed, with the angles acute often winged. *Pappus* of short broad truncate or lacerated paleae, with the addition to the angles of the achenes of 2-3 longer longitudinally folded lanceolate acute or sub-aristate scales.

Perennial herbs, glabrous or laxly villous; leaves opposite or alternate; heads large, solitary and peduncled at the apex of the branches.

Endemic; species 6, found in the Transvaal and Natal.

9096 95. ANISOPAPPUS, Hook. et Arn.

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in a few series, a little unequal; the outer herbaceous; the inner dry. *Receptacle* convex, covered with folded deciduous paleae clasping the bisexual florets. *Ray florets* female, in 1-2 series. *Corolla* ligulate, with a spreading 3-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* with a short narrow sub-conical tube, and an elongated slightly widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* linear, a little broadened above, flattened, obtuse. *Achenes* many-ribbed, glabrous or hairy on the ribs. *Pappus* coroniform, of short distinct lacerated unequal paleae and 2-5 slender unequal bristles exceeding the paleae.

Annual herbs, scabrid-pubescent; leaves alternate, toothed; heads medium-sized, arranged in a lax terminal corymb.

Species 7, mostly African; 1 species found in South China; 1 species in South Africa, described from the Transvaal.

9098 96. OSMITOPSIS, Cass.

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in a few series, a little unequal, herbaceous, or the outer foliaceous and longer. *Receptacle* convex, covered with narrow hyaline caducous paleae between the florets. *Ray florets* female, in 1 series, sterile, with an abortive style. *Corolla* white, ligulate, spreading, entire. *Disc florets* bisexual, fertile. *Corolla* tubular, with a scarcely widened 5-toothed limb. *Anthers* sagittate at the base. *Style-branches* narrow, truncate. *Achenes* of rays slender, empty; of the disc oblong, sub-4-angled, glabrous. *Pappus* 0.

Aromatic shrubs, glandular-pubescent, densely leafy; leaves alternate; heads medium-sized or large, sessile at the apices of the branches.

Endemic; species 3, found in the south-western districts.

9099 97. OSMITES, Linn.

Heads heterogamous, radiate. *Involucre* hemispherical or broadly campanulate; bracts in a few series, imbricate, a little unequal, rigid, herbaceous, or the margin and the apex scarious. *Receptacle* convex, covered with rigid channelled paleae clasping the florets. *Ray florets* female, in 1 row, fertile or rarely sterile. *Corolla* white, ligulate, spreading, entire, or 2-3-toothed. *Disc florets* bisexual, fertile. *Corolla* tubular, with a scarcely widened 5-toothed limb. *Anthers* sagittate at the base. *Style-branches* narrow, flattened, truncate. *Achenes* narrow, glabrous or pubescent. *Pappus* of many paleae; paleae short, entire or lacerated, free, rarely elongated and aristate-acuminate.

Aromatic undershrubs, glabrous or glandular-pubescent; leaves alternate, toothed or pinnatifid; heads medium-sized or large, solitary at the apex of the branches.

Endemic; species 8, found in the south-western districts and extending to Riversdale.

9130

98. ACANTHOSPERMUM, Schrank

Heads heterogamous, radiate. *Involucre* double; the outer in 1 row, herbaceous; inner tightly involute at the base of the ray-florets and closing in above the achene early. *Receptacle* small, conical, covered with folded membranous paleae surrounding the bisexual florets. *Ray florets* female, in one row, fertile. *Corolla* ligulate, with a small concave or sub-spreading 3-toothed lamina. *Disc florets* bisexual, sterile. *Corolla tube* short, with a campanulate 5-fid limb. *Anthers* truncate at the base, sub-entire. *Style* of the bisexual florets undivided. *Achenes* of ray florets oblong or laterally compressed, bare; the surrounding bract enlarged, hardened, barbed-muricate and sometimes with 1-3 spines, tightly involute and almost bark-like.

Diffuse annual herbs, scabrid-pubescent or glabrous; leaves opposite, toothed or rarely incised; heads small, sub-sessile in pairs at the apex of the branches, or sub-sessile in the axils of the leaves.

Species 4, natives of tropical America and Galapagos Islands. 1 species found in South Africa as a weed.

9138

99. PARTHENIUM, Linn.

Heads heterogamous, radiate. *Involucre* broadly campanulate or hemispherical; bracts in 2 to few series, imbricate, broad, adpressed, obtuse, dry, sub-equal, or the outer gradually smaller. *Receptacle* small, convex or conical, covered with cuneate paleae clasping the bisexual florets. *Ray florets* female, in 1 row, fertile. *Corolla* ligulate, with a short tube and a short broad concave 2-toothed or 2-fid lamina. *Disc florets* bisexual, sterile. *Corolla* with a slightly widened 5-toothed limb. *Anthers* entire at the base. *Style* of the bisexual florets undivided. *Achenes* glabrous or pilose; of the rays dorsally compressed, keeled on the inner face, crowned, or with 2-3 sometimes soft sometimes elongated and rigid awns, each (achene) with the paleae which clasp 2 of the outer bisexual florets, inserted at the base of the involucre bracts and with its nerviform margins adnate almost from the base to the middle of the keels of the paleae; achenes of disc florets empty.

Herbs, undershrubs, or shrubs, with tomentose branches; leaves alternate; heads small, arranged in terminal panicles, sometimes densely corymbose, sometimes lax.

Species about 12, natives of North and central America and western India; 1 species naturalised in South Africa.

9146

100. AMBROSIA, Linn.

Plants monoecious; the male heads with many bisexual but sterile florets; the female heads with one female floret without a corolla. *Involucre* of male heads hemispherical, winged, gamophyllous, shortly 5-12-lobed, herbaceous. *Receptacle* almost flat, covered with filiform paleae subtending the florets, or sub-nude. *Corolla* with a very short tube and a campanulate 5-fid limb. *Anthers* sub-free, obtuse and entire at the base. *Style* undivided, penicillate-dilated at the apex. *Achenes* rudimentary. *Involucre* of female heads gamophyllous, closed, ovoid or sub-globose, often with a series of 4-8 tubercles or prickles on the back below the apex, at the apex contracted into a beak surrounding the style. *Corolla* 0. *Style* almost 2-partite; the branches exerted from the apex of the involucre bract. *Achenes* obovoid or ovoid, thick, naked, included in the hardened involucre.

Annual or perennial herbs, hirsute ; leaves alternate or opposite, entire, lobed, incised, or pinnately-dissected once or twice or three times ; male heads small, sessile or shortly pedunculate, nodding, arranged in simple leafless spikes or racemes at the apex of the branches ; female heads sessile and solitary in the axils of the upper leaves, or glomerate.

Many species described, but scarcely more than 12 may be regarded as specifically distinct, mostly American. One species occurs as a weed in South Africa.

9148

101. XANTHIUM, Linn.

Plants monoecious ; male heads globose, with many bisexual but sterile florets ; female heads with 2 fertile female florets without corollas. *Involucre* of male heads short, with a few narrow bracts in 1-2 series. *Receptacle* cylindric, covered with cuneate hyaline or linear-spathulate paleæ clasping the florets. *Corolla* with a widened 5-toothed limb. *Filaments* monadelphous from the base of the corolla, with the anthers free, connivent, obtuse at the base. *Style* undivided, slender, sub-dilated at the apex. *Achenes* rudimentary. *Involucre* of female heads gamophyllous, closed, ovoid, furnished with sharp hooks, 2-beaked at the apex, 2-locular (due to the bracts tightly enveloping the 2 florets), often with 2-3 small free outer bracts. *Corolla* 0. *Style-branches* exerted from the beak of the involucre. *Achenes* thick, solitary in the loculi of the enlarged and hardened involucre.

Annual herbs, scabro-pubescent or glabrous, armed with trifid spines or un-armed ; leaves alternate, sometimes lobed and tomentose beneath, sometimes deeply toothed and green on both sides ; heads axillary and solitary, or glomerate ; the male heads at the apex of the branches ; the female heads below the male heads.

Species about 28, natives of North America and Europe ; 4 species occur as weeds in South Africa.

9155

102. ZINNIA, Linn.

Heads heterogamous, radiate. *Involucre* broadly or narrowly campanulate, or sub-cylindric ; bracts in 3 to many rows, imbricate, broad, obtuse, dry and adpressed, or membranous on the margins at the apex ; the outer gradually smaller. *Receptacle* conical or at length cylindric, covered with folded paleæ clasping the disc florets. *Ray florets* in 1 row, female. *Corolla* ligulate, spreading, with an entire sessile lamina, or often attenuated into a short persistent tube. *Disc florets* bisexual, fertile. *Corolla* with a little-widened elongated cylindric limb shortly 5-fid at the apex. *Anthers* entire at the base. *Style-branches* elongate, obtuse or sub-truncate. *Achenes* narrow, striate, truncate at the apex, or produced at the angles into short teeth, glabrous or ciliate on the angles. *Pappus bristles* 1-3, unequal, or absent especially on the outer achenes.

Annual or perennial herbs or shrubs ; leaves opposite ; heads medium-sized to large, pedunculate, solitary or in pairs, with the peduncle often thickened below the head.

Species about 17, mostly natives of Mexico ; 1 species in Australia ; 1 species naturalised in South Africa.

9160

103. SIEGESBECKIA, Linn.

Heads heterogamous, sub-radiate. *Involucre* campanulate or hemispherical ; bracts few, herbaceous, glandular ; the outer linear-cuneate, spreading ; the inner erect, concave, embracing or wrapped round the ray florets. *Receptacle* small, covered with concave membranous paleæ

which subtend or embrace the florets. *Ray florets* in one row, female. *Corolla* with a small limb sometimes broad, ligulate, spreading and 3-toothed, sometimes oblique or sub-equally campanulate and 2-3-fid. *Disc florets* bisexual, fertile, or the inner sterile. *Corolla* with a short campanulate and 5-fid limb, or the limb narrow and 3-4-toothed. *Anthers* entire at the base. *Style-branches* short, flat, acuminate or somewhat obtuse. *Achenes* obovoid-oblong, scarcely compressed, often incurved, at length turgid, obtuse, glabrous.

Herbs, often annual, more or less glandular-pilose; leaves opposite, toothed; heads small, arranged in lax leafy panicles.

Species 6, widely spread; 1 species naturalised in South Africa.

9166

104. ECLIPTA, Linn.

Heads heterogamous, radiate. *Involucre* hemispherical or broadly campanulate: bracts in sub-2-series, herbaceous, sub-equal, or the inner shorter. *Receptacle* flat or convex, covered with narrow folded paleae sub-clasping many of the florets; the inner paleae narrow, aristiform, or none in the centre of the receptacle. *Ray florets* female, sub-2-seriate, fertile or sterile. *Corolla* ligulate, spreading, with a small narrow entire or 2-toothed limb. *Disc florets* bisexual, fertile. *Corolla* with the limb shortly 4-5-fid. *Anthers* obtuse and entire at the base, or minutely 2-toothed. *Style-branches* flattened, with an obtuse and very short or triangular appendage. *Achenes* of the rays narrowly triquetrous, often empty; achenes of disc thickish, slightly laterally compressed, crowned with 3 short awns, or with the margins a little prominent and entire or toothed, glabrous.

Annual or perennial herbs, more or less strigose-pubescent or hirsute; leaves opposite; heads small, pedunculate, solitary, or in pairs at the apex of the branches, or axillary.

Species about 3-4, common in all the warm regions; 1 species naturalised in South Africa.

9192

105. WEDELIA, Jacq.

Heads heterogamous, radiate. *Involucre* ovoid-campanulate or sub-hemispherical; bracts sub-2-seriate; the outer 3-5 often herbaceous or foliaceous; the inner dry or rigidly sub-membranous. *Receptacle* flat or convex, covered with concave or folded paleae embracing the florets. *Ray florets* female. *Corolla* ligulate, spreading, entire or 2-toothed at the apex. *Disc florets* bisexual, fertile, or the inner sterile. *Corolla* with an elongated cylindric or narrow-campanulate limb, 5-toothed or shortly 5-fid at the apex. *Anthers* entire or shortly sagittate. *Style-branches* short or elongated, with an acute appendage. *Achenes* cuneate-oblong or obovate, thick, laterally compressed, or those of the rays triquetrous, glabrous or pilose, smooth or tuberculed. *Pappus* saucer-shaped, toothed or divided into squamulae, contracted at the base into a neck or ring, sometimes reduced to a scarcely prominent ring, or obsolete, rarely with the addition of 1-2 small setiform awns.

Herbs or undershrubs, scabro-pubescent or hirsute; leaves opposite, often toothed, rarely 3-fid or entire; heads medium-sized, rarely large or small, pedunculate at the apex of the branches or in the upper leaf-axils.

Species about 84, found in warm countries; 2 species recorded from the Transvaal, Zululand, and Natal.

9204

106. MELANTHERA, Rohr.

Heads sometimes homogamous and discoid, sometimes heterogamous and radiate. *Involucre* hemispherical, short; bracts 2-3-seriate, a little unequal, dry, or the outer herbaceous. *Receptacle* convex or at length conical, covered with striate acuminate concave rigid paleae embracing or subtending the florets. *Ray florets* (when present) female, fertile, or without a style and sterile. *Corolla* ligulate, spreading, entire or 2-toothed. *Disc florets* bisexual, fertile. *Corolla* with a widened elongated limb, shortly 5-fid at the apex. *Anthers* truncate or minutely sagittate. *Style-branches* elongated, with a narrow or lanceolate acute hairy appendage. *Achenes* short, thick, compressed-4-angled or those of the rays 3-angled, truncate or concave at the apex, glabrous or pilose. *Pappus* of 2 to many unequal ciliate caducous bristles; in the ray florets often fewer or none.

Herbs or undershrubs, scabro-pubescent or villous; leaves opposite, petioled, toothed or rarely hastately 3-lobed; heads medium-sized, pedunculate at the apex of the branches or in the axils of the upper leaves.

Species about 36, natives of tropical America and Africa; 4 species in South Africa, found in the Transvaal and from Natal to Pondoland; also in S.W. Africa.

9207

107. SPILANTHES, Jacq.

Heads heterogamous, radiate, or often homogamous by the absence of the rays. *Involucre* short, campanulate; bracts sub-2-seriate, a little unequal; the outer membranous-herbaceous; the inner dry at the base. *Receptacle* convex or elongated, covered with folded paleae embracing the bisexual florets and often contracted into a stipes with the ovary. *Ray florets* female, in 1 row. *Corolla* ligulate, with a short (or rarely elongated) spreading entire or 2-3-toothed limb. *Disc florets* bisexual, with a widened or narrow-campanulate 4-5-fid limb. *Anthers* truncate at the base, entire or rarely minutely 2-toothed. *Style-branches* somewhat long, truncate at the apex. *Achenes* glabrous or pilose; of the rays 3-angled or dorsally compressed; of disc laterally compressed, with the margin or the angles very often ciliate. *Pappus* bristles 2-3, slender, or 0.

Annual, rarely perennial, herbs; leaves opposite, often toothed; heads medium-sized or small, often long-pedunculate, solitary at the apex of the branches or in the upper leaf-axils.

A genus of about 70 described species, mostly American, probably not all specifically distinct; 1 species in South Africa, extending from the Transvaal and Natal to Komgha.

9227

108. COREOPSIS, Linn.

Heads heterogamous, radiate, or rarely homogamous by the absence of the rays. *Involucre* double; bracts more or less connate at the base; the inner larger, membranous, in 1-2 series, sub-equal; the outer narrow, herbaceous or sub-membranous, often spreading. *Receptacle* flat or somewhat convex, covered with flat or concave membranous striate paleae clasping the bisexual florets. *Ray florets* in 1 row, neuter, or rarely female and fertile. *Corolla* ligulate, with a spreading entire or 2-3-toothed limb. *Disc florets* bisexual, or the innermost sterile. *Corolla* with a cylindric or narrowly campanulate shortly 5-fid limb. *Anthers* entire at the base, or scarcely minutely 2-toothed. *Style-branches* penicillate or sub-nude at the apex, truncate, or with a short subulate or acute appendage. *Achenes* dorsally compressed, obovate, oblong, or elongated, with the margin winged or rarely nude, truncate at the apex and with 2 awns or squamæ or teeth, or naked.

Herbs or rarely shrubs, glabrous or pilose; leaves opposite or rarely alternate, entire, toothed, lobed, or variously dissected; heads medium-sized or large, long-peduncled, solitary or laxly corymbose-panicled.

Species about 122, natives of America, tropical Africa, and the Sandwich Islands; found as an escape in South Africa.

9232

109. CHRYSANTHELLUM, L.C.Rich.

Heads heterogamous, radiate. *Involucre* campanulate, at length hemispherical; bracts in 1-2 rows, a little unequal, membranous. *Receptacle* flat, covered with narrow flat scarious paleae subtending all or some of the florets. *Ray florets* female, in 1 row. *Corolla* ligulate, with a spreading entire or 2-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* with a short tube and a campanulate 5-fid limb. *Anthers* obtuse at the base, entire. *Style-branches* slender, ending in a long subulate appendage. *Achenes* linear-oblong, dorsally compressed; those of the rays and outer disc florets thick, with a very obtuse margin; the inner often flat and 2-winged; all naked or minutely 2-toothed, smooth, or the outer tuberculate.

Annual herbs, diffuse or branched; leaves radical, often incised-toothed; cauline leaves alternate, dissected; the upper smaller and little divided; heads small, pedunculate at the apex of the branches or in the axils of the upper leaves.

Species about 4, widely spread; 1 species occurs as a weed in South Africa.

9236

110. THELESPERMA, Less.

Heads heterogamous, radiate, or often homogamous by the absence of the rays. *Involucre* double; the inner broadly campanulate, with the bracts in 1 row, membranous; the outer bracts short, few. *Receptacle* flat, covered with scarious flat or concave paleae subtending the bisexual florets. *Ray florets* in 1 row, neuter. *Corolla* (when present) ligulate, spreading. *Disc florets* bisexual, fertile. *Corolla* tubular, with a wide cylindric or narrowly campanulate 4-5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* papillose-puberulous, with an acute appendage. *Achenes* linear or linear-oblong, thick, more or less dorsally compressed, naked, or crowned with 2 bristles with retorse prickles, glabrous, smooth or tuberculate.

Herbs or undershrubs; leaves opposite or the upper alternate, linear, often filiform, pinnatisect or entire above; heads medium-sized, long-pedunculate.

Species about 8, natives of Mexico; one species found in extra-tropical America; 1 species occurs as a weed in South Africa.

9237

111. BIDENS, Linn.

Heads heterogamous, radiate, or homogamous by the absence of the rays. *Involucre* campanulate or sub-hemispherical; bracts sub-2-seriate, often shortly connate at the base; the outer often herbaceous, sometimes short, sometimes expanded into an elongated leaf; the inner membranous, often with white margins. *Receptacle* flat or somewhat convex, covered with narrow flattish paleae subtending the bisexual florets. *Ray florets* in 1 row, neuter or rarely female. *Corolla* ligulate, with a spreading or sub-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a cylindric 5-fid limb. *Anthers* blunt at the base or minutely sagittate. *Style-branches* hairy above, with a short acute or long subulate appendage. *Achenes* dorsally compressed or sub-4-angled, with 2-4 rigid persistent awns retorsely barbellate, rarely with the barbs reduced to small glands, glabrous or shortly pilose.

Annual or perennial herbs ; leaves opposite, toothed, incised, or variously pinnatisect ; heads sometimes medium-sized or large, solitary or in pairs at the apex of the branches, sometimes small, numerous, irregularly corymbose-paniculate.

Species described about 220, probably not all valid, widely dispersed ; 3 species recorded from South Africa as weeds.

9238

112. COSMOS, Cav.

Heads heterogamous, radiate, or rarely homogamous by the absence of the rays. *Involucre* sub-hemispherical ; bracts 2-seriate, connate at the base, membranous, striate, a little unequal, or the outer smaller. *Receptacle* flat, covered with flat or concave paleae subtending the bisexual florets. *Ray florets* in 1 row, neuter, with a spreading entire or sub-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a cylindric shortly 5-fid limb. *Anthers* entire at the base, or scarcely very minutely 2-toothed. *Style-branches* slender, thickened above, hairy, with a short acute appendage. *Achenes* narrow, sub-5-angled or dorsally somewhat compressed, with the apex more or less attenuated into a beak, with 2-4 persistent awns with retrorse barbules, or crowned with spines, glabrous.

Annual or perennial herbs, glabrous or pilose ; leaves opposite, entire, lobed, or variously pinnatisect ; heads large or medium-sized, long-peduncled, solitary or laxly corymbose-paniculate.

An American genus of about 16 species ; one species found as a garden escape in parts of South Africa.

9245

113. TRIDAX, Linn.

Heads heterogamous, radiate. *Involucre* ovoid, campanulate, or sub-hemispherical ; bracts in a few series, a little unequal, or the outer shorter, broadly membranous or herbaceous. *Receptacle* flat or convex, covered with membranous paleae subtending the florets. *Ray florets* female. *Corolla* ligulate or sub-2-lipped. *Disc florets* bisexual, fertile. *Corolla* tubular, with an elongated slightly widened 5-fid limb. *Anthers* shortly sagittate at the base. *Style-branches* hairy at the apex, with a short or long subulate appendage. *Achenes* turbinate, more or less silky-villous. *Pappus* of many paleae, aristate-acuminate, plumose-ciliate, elongated or short.

Perennial herbs ; leaves opposite, incised-toothed or pinnately dissected ; heads medium-sized, long-peduncled.

A tropical American genus of about 29 species ; one species naturalised in South Africa.

9246

113a. GALINSOGA, Ruiz & Pav.

Heads heterogamous, radiate. *Involucre* cylindric, ovoid, broadly campanulate, or hemispherical ; bracts few, in 1-2 rows, ovate, obtuse, membranous, striate, sub-equal, or the outer shorter and slightly herbaceous. *Receptacle* flat or elongated, covered with paleae subtending the florets. *Ray florets* female. *Corolla* white, ligulate. *Disc florets* bisexual, fertile. *Anthers* shortly sagittate at the base. *Style-branches* somewhat acute, or with a short acute appendage. *Achenes* angular, or the outer dorsally compressed, glabrous or pilose. *Pappus* of fimbriated scales, or sometimes crown-like, or absent from the ray achenes.

Pilose or glabrous annual herbs ; leaves opposite, toothed or entire ; heads small, on distinct peduncles.

Species 4-5, natives of the warmer parts of America ; one species naturalised in South Africa.

9287

114. CADISCUS, E.Mey.

(Symphipappus, Klatt)

Heads heterogamous, radiate. *Involucre* campanulate, at length cylindric; bracts in 1 row, connate into a 8-10-lobed cup beyond the middle. *Receptacle* flat, nude. *Rays* female, in 1 row. *Corolla* ligulate, with a spreading entire lamina. *Disc florets* bisexual, fertile, or the inner sterile. *Corolla* with a slender tube and a campanulate 5-fid limb. *Anthers* obtuse at the base, entire. *Style-branches* truncate, penicillate. *Achenes* linear, 10-12-ribbed. *Pappus* of minutely barbellate bristles, as many as and continuous with the ribs of the achenes, at length slightly paleaceous.

A marsh herb; leaves alternate, amplexicaul; heads medium-sized or small, peduncled at the apex of the branches opposite the leaves.

Endemic; species 1, found in the Malmesbury district.

9291

115. SCHKUHRIA, Roth.

Heads heterogamous, radiate, or homogamous by the absence of the ray florets. *Involucral bracts* few (5-8), sub-equal, cuneate, with the margin narrowly scarious or coloured, sometimes with 2-3 additional outer bracts. *Receptacle* small, honeycombed or nude. *Ray florets* (when present) in 1 row, female. *Corolla* ligulate, with a spreading often small entire limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with a campanulate 5-fid limb. *Anthers* sagittate at the base. *Style-branches* flattened, rotund-truncate or very shortly appendiculate at the apex. *Achenes* linear-cuneate, 4-5-angled, glabrous or hirsute on the angles. *Pappus* of 8-10 paleae; paleae sometimes short, equal, obtuse, or sometimes the alternate ones (or all) lanceolate and aristate.

Annual herbs; leaves alternate, or the lower or some opposite, slender, dissected; heads small, long peduncled.

A south and central American genus of about 13 species, one of which occurs as a weed in South Africa.

9311

116. TAGETES, Linn.

Heads heterogamous, radiate, or rarely homogamous by the absence of the rays. *Involucre* cylindric; bracts in 1 row, equal, connate high up, rarely with a single small outer bract. *Receptacle* flat, often small, nude, or slightly honeycombed and fimbriated. *Ray florets* in 1 row or solitary, female. *Corolla* ligulate, with an entire or 2-lobed lamina, sometimes large and spreading. *Disc florets* bisexual, fertile. *Corolla* tubular, with the limb often ample and 5-fid. *Anthers* obtuse and entire at the base. *Style-branches* slender, sometimes truncate and penicillate, sometimes shortly appendiculate. *Achenes* linear, attenuate at the base, compressed or angled, with a conspicuous basal callus, glabrous or pilose. *Pappus* of few paleae (often 5-6), various.

Erect herbs; leaves opposite, pinnatisect, or rarely undivided and serrulate, with immersed glands; heads small, medium-sized, or large, long-peduncled or densely corymbose.

Species about 39, in the warmer parts of America; 1 species occurs as a weed in South Africa.

9320

117. ERIOCEPHALUS, Linn.

Heads heterogamous, radiate or sub-discoïd. *Involucre* double; outer bracts 4-5, ovate or oblong, with scarious margins, free; inner campanulate, densely woolly, with the bracts in 1 series and connate high up into a toothed cup. *Receptacle* flat, covered with paleae subtending the florets.

Ray florets in 1 row, female, fertile. *Corolla* ligulate, with the lamina sometimes spreading and 3-toothed, sometimes small and erect. *Disc florets* bisexual, sterile. *Corolla* with a slender tube and a widened 5-fid limb. *Anthers* obtuse and entire at the base. *Style* undivided, truncate. *Achenes* 4-5-ribbed, glabrous or villous. *Pappus* 0.

Rigid shrubs, silky-villous, canescent, or glabrous, aromatic: leaves alternate or sub-opposite, often fascicled, entire or rarely 3-lobed; heads small, shortly peduncled, in racemes, sub-umbels, or rarely solitary.

Endemic; species 20, widely spread; absent from Natal.

9321

118. LASIOSPERMUM, Lag.

Heads heterogamous, radiate or discoid. *Involucre* short, hemispherical, reflexed in the fruiting head; bracts in a few series, imbricate, with scarios margins; the outer shorter. *Receptacle* flat or convex, covered with hyaline paleae subtending the florets. *Ray florets* female. *Corolla* ligulate, with an entire sometimes elongated and spreading sometimes small and erect lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a campanulate 5-fid limb. *Anthers* truncate at the base, entire or minutely 2-toothed. *Style-branches* truncate at the apex. *Achenes* oblong, 8-10-ribbed, hairy when young, covered with thick wool when old. *Pappus* 0.

Perennial (rarely annual) herbs; leaves alternate, variously pinnatisect; heads medium-sized or small, peduncled at the apex of the branches.

Endemic; species 3, found in S.W. Africa, the south-western districts from Clanwilliam to Worcester, the north-western and north-eastern districts, Basutoland, and recorded from the Albany and Komgha districts.

9322

119. OEDERA, Linn.

Heads heterogamous, radiate, grouped within a common involucre. *Involucre* of individual heads ovoid or sub-globose; bracts in many rows, imbricate, dry; the inner with a scarios-lacerated apex; the outer gradually smaller. *Receptacle proper* small, covered with linear paleae. *Ray florets* female. *Corolla* ligulate, with the limb of the outer florets of the cluster longer than the limb of the ray florets towards the centre of the cluster. *Disc florets* bisexual, all or some fertile. *Corolla* with a slender tube and a little widened 5-toothed limb. *Anthers* entire or very minutely 2-toothed at the base. *Style-branches* truncate at the apex. *Achenes* linear, 4-5-angled, glabrous. *Pappus* paleaceous, shortly cup-like, or longer and tubular, lacerated, or divided into distinct paleae.

Shrubs, glabrous, scabrid-puberulous, or sparingly covered with long wool; leaves opposite, ternate, or spirally imbricate; heads in sessile clusters at the apex of the branches.

Endemic; species 4, extending from the south-western districts through the coastal belt to Komgha.

9323

120. EUMORPHIA, DC.

Heads heterogamous, radiate. *Involucre* ovoid or sub-globose; bracts in many series, dry; the inner scarios-lacerated at the apex; the outer gradually smaller. *Receptacle* convex, covered with narrow concave rigid paleae sub-clasping the bisexual florets, sometimes paleae few and subtending the outer florets only. *Ray florets* in 1 row, female. *Corolla* ligulate, with a spreading or reflexed 3-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a little widened shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* slender, obtuse, sub-truncate. *Achenes* prominently 8-15-ribbed, glabrous. *Pappus* 0.

Shrubs : leaves small, decussate ; heads small, solitary at the apex of the branches, or sub-corymbose.

Endemic ; species 4, found on the Wittebergen above Barkly East and along the Drakensbergen to the northern Transvaal.

9325

121. PHAEOCEPHALUS, Sp. Moore

Heads homogamous, discoid, 4-8-flowered ; florets all bisexual, 1-2 fertile, the remainder sterile. *Involucre* narrowly cylindric ; bracts 5, in one row, densely villous without. *Receptacle* small, flat, nude. *Corolla* tubular, with a 5-lobed limb. *Anthers* obtuse at the base, entire. *Style-branches* truncate and penicillate at the apex. *Achenes* 3-4-angled, striate, glabrous. *Pappus* of a few short lacerated connate paleae in 1 row.

Shrublet ; leaves alternate, entire or trifid ; heads small, grouped in dense-terminal globose glomerules.

Endemic ; species 1, recorded only from the Zwartberg Pass (Oudtshoorn district).

9326

122. ATHANASIA, Linn.

(Oligodora, DC.)

Heads homogamous, discoid, with the florets all bisexual and fertile. *Involucre* oblong, ovoid-sub-campanulate, or sub-globose ; bracts in many series, imbricate, dry or rarely with a herbaceous appendage. *Receptacle* flat or somewhat convex, covered with paleae subtending the florets. *Corolla* with a slender tube and a widened or campanulate 5-fid limb. *Anthers* obtuse at the base, entire, sometimes sagittate. *Style-branches* truncate, penicillate. *Achenes* with 5 prominent ribs, angled or narrowly 5-winged, glabrous. *Pappus* of many narrow entire or lacerated scales, or of thick hyaline often articulated hairs, or none.

Shrubs or undershrubs, glabrous, pubescent, or villous, often aromatic ; leaves alternate, entire, toothed, incised, or pinnatisect ; heads small, densely corymbose, very rarely solitary.

Species about 61, natives of Africa, Madagascar, and South America ; 58 species in South Africa, mostly in the coastal districts, but extending into S.W. Africa, and eastwards into Basutoland, the Transvaal, and Natal.

9330

123. ANTHEMIS, Linn.

Heads heterogamous, radiate, very rarely homogamous by the absence of the rays. *Involucre* hemispherical ; bracts in many series, imbricate, with scarious margins. *Receptacle* convex, at length conical or oblong, covered with broad hyaline or rigid paleae (sometimes reduced to awns) subtending the bisexual florets. *Ray florets* female, in 1 row, fertile, or sterile, or neuter by the abortion of the style. *Corolla* ligulate, with a terete or 2-winged tube, with an entire or very shortly 2-3-toothed spreading lamina. *Disc florets* bisexual, fertile. *Corolla-tube* 2-winged or compressed, with the base often thickened, gibbous on one or both sides, with a little widened or narrowly campanulate 5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* truncate and penicillate at the apex. *Achenes* oblong, 4-5-angled, 8-10-ribbed, glabrous. *Pappus* of very minute connate or separate paleae, or none.

Annual or perennial herbs, pubescent, laxly sub-woolly, or glabrous ; leaves alternate, incised, toothed, pinnatifid, or variously pinnatisect ; heads medium-sized or large, peduncled at the apices of the branches, rarely in lax corymbs.

A genus of over 80 species, found in Europe, Asia, the Mediterranean Region, and North Africa : 2 species naturalised in South Africa and found in the north-western districts and the Transvaal.

9332

124. ACHILLEA, Linn.

Heads heterogamous, radiate, or homogamous by the absence of the rays. *Involucre* ovoid or campanulate, rarely sub-hemispherical; bracts in a few series, often scarious, sometimes edged with black. *Receptacle* sub-flat, convex, or elongated, covered with membranous paleae subtending the bisexual florets. *Ray florets* female, fertile or rarely neuter. *Corolla* ligulate, with the lamina often spreading and 3-toothed. *Disc florets* bisexual, fertile. *Corolla* with a sometimes 2-winged tube, with the limb a little widened or narrowly campanulate and 5-fid at the apex. *Anthers* obtuse and entire at the base. *Style-branches* truncate and penicillate at the apex. *Achenes* more or less compressed, with a narrow cartilaginous margin, glabrous. *Pappus* 0.

Perennial herbs, pubescent, villous, or almost glabrous; leaves alternate, sometimes minutely serrate, sometimes often pinnatifid or variously pinnatisect; heads small, arranged in corymbs, rarely few and large.

Species about 160, distributed in the northern temperate regions; one species naturalised in South Africa.

9336

125. PHYMASPERMUM, Less.

(*Adenachaena*, DC.; *Iocaste*, E.Mey.)

Heads heterogamous, radiate, or rarely here and there homogamous by the absence of the rays. *Involucre* campanulate or hemispherical; bracts in a few series, imbricate, dry; the inner with scarious margins; the outer smaller. *Receptacle* small, flat, at length elevated, nude. *Ray florets* female. *Corolla* ligulate, with a spreading entire lamina. *Disc florets* bisexual, fertile, or the inner sterile. *Corolla* tubular, with a campanulate 5-fid limb. *Anthers* truncate and entire at the base. *Style-branches* truncate at the apex. *Achenes* narrowly oblong, terete, or the outer slightly dorsally compressed, prominently 8-10-ribbed, naked, or with the ribs produced into short teeth, glandular-papillose. *Pappus* 0.

Glabrous shrubs or undershrubs; leaves alternate, small, linear or sub-terete, entire or 3-fid; heads small or medium-sized, solitary at the apices of the branches, or laxly corymbose-panicled.

Species 8; 1 species found in Patagonia; the remainder in South Africa, found in the central and north-western districts; recorded also from the Zwartberg Pass (Oudtshoorn district).

9337

126. LIDBECKIA, Berg.

Heads heterogamous. *Involucre* hemispherical; bracts in a few series, imbricate, narrow, acute, ciliate; the outer a little smaller. *Receptacle* flat or somewhat convex, naked or sparsely and minutely fimbriate. *Ray florets* in 1 row, neuter. *Corolla* slender, with a spreading entire limb. *Disc florets* bisexual, fertile. *Corolla* tubular, somewhat thick, with a scarcely widened shortly 4-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* truncate at the apex. *Achenes* narrowly oblong, sub-terete, with 8-10 raised ribs, glandular-papillose. *Pappus* 0.

Glabrous or tomentose-villous undershrubs; leaves alternate, incised or pinnatifid; heads medium-sized, long-peduncled at the apices of the branches.

Endemic; species 3, recorded from Clanwilliam to the Cape and from the northern Transvaal.

9338

127. THAMINOPHYLLUM, Harv.

Heads heterogamous, radiate. *Involucre* campanulate; bracts in a few series, a little unequal, narrow, dry, silky. *Receptacle* flat, nude. *Ray florets* few, neuter. *Corolla* ligulate, with a spreading entire lamina. *Disc florets* bisexual, fertile. *Corolla* with an elongated tube and a campanulate 4-fid limb, with acuminate lobes. *Anthers* obtuse and entire at the base. *Style-branches* truncate at the apex. *Achenes* narrowly-oblong, sub-compressed, crowned with the persistent style-base or nectary, glabrous. *Pappus* 0.

Small shrubs, silky-pubescent or villous; leaves alternate, crowded, small; heads small, shortly peduncled at the apices of the branches.

Endemic; species 2, found in the south-western districts and at George.

9339

128. MATRICARIA, Linn.

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in a few series, imbricate. *Receptacle* hemispherical, conical, or elongated, very rarely plano-convex, nude. *Ray florets* female, fertile or sterile. *Corolla* ligulate, with an elongated spreading sub-entire lamina. *Disc florets* bisexual, all or most fertile. *Corolla* with a terete or 2-edged tube and a little widened 4-5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* truncate and penicillate at the apex. *Achenes* oblong, often incurved, with 3-5 prominent ribs, glabrous. *Pappus* very minutely setulose, obliquely cupular or truncate, or 0.

Annual or perennial herbs; leaves alternate, variously pinnatisect, with the segments linear or filiform; heads small or medium-sized, peduncled at the apices of the branches, solitary or rarely in corymbs.

Species about 20, mostly in the northern hemisphere; 7 species in South Africa, extending in the coastal belt from Clanwilliam to Natal and into the Transvaal; 1 or 2 species found in the central and north-western districts.

9340

129. LEPIDOSTEPIUM, Oliv.

Heads heterogamous, radiate. *Involucre* broadly campanulate or sub-hemispherical; bracts in many rows, imbricate, narrow, keeled, with the apex of the inner scarious. *Receptacle* flat, pitted, glandular-fimbriate. *Ray florets* female, in 1 row. *Corolla* ligulate, with a spreading 3-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with an elongated cylindric shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* linear, slightly flattened, truncate at the apex. *Achenes* (immature) sub-terete, glandular-hispid. *Pappus* of free short paleae, or an entire connate or sub-divided crown.

Perennial herbs, laxly cano-tomentose or glabrescent, glandular-scabrid; leaves alternate, decurrent, entire or toothed; heads medium-sized, arranged in a few-flowered lax corymb at the apices of the branches.

Endemic; species 1, recorded from the Katberg.

9341

130. CHRYSANTHEMUM, Linn.

Heads heterogamous, radiate, or in a few species and varieties homogamous by the absence of the rays. *Involucre* hemispherical, spread out, or rarely campanulate; bracts in many series, imbricate; the innermost scarious at the apex; the outer shorter, often with scarious or brown margins. *Receptacle* flat, convex, or hemispherical, rarely at length sub-conical. *Ray florets* female, in 1 row. *Corolla* ligulate, with a spreading entire or toothed margin. *Disc florets* bisexual, fertile, or here and there sterile.

Corolla-tube terete or 2-winged, with the limb a little widened or cylindric campanulate, 4-5-fid at the apex. *Anthers* obtuse and entire at the base. *Style-branches* truncate and penicillate at the apex. *Achenes* sub-terete or variously angled, equally or irregularly 5-10-ribbed, glabrous or sometimes glandular between the ribs. *Pappus* of palcae, well developed, usually coroniform, rarely palcae free, or sometimes pappus minute or 0.

Perennial or annual herbs; leaves alternate, entire, toothed, incised, or dissected; heads large or medium-sized, long-peduncled at the apex of the branches, sometimes small and arranged in lax or dense corymbs.

Species about 200, found in Europe, temperate Asia, Africa, the Orient, and Arctic America; 8 species in South Africa (some introduced), found in the coastal belt from Namaqualand to Natal and the Transvaal.

9350

131. OTOCHLAMYS, DC.

Heads heterogamous, discoid, all the florets pedicelled. *Involucre* hemispherical or campanulate; bracts in sub-2-rows; the outer of a few broad herbaceous loose scales; the inner of few or many scarious adpressed scales. *Receptacle* flat, covered with the persistent tooth-like pedicels of the florets. *Marginal florets* in 1 row, female. *Corolla* none. *Disc florets* bisexual, fertile. *Corolla* with a broadly winged tube, produced at the base into a broad concave ear-like spur which completely enwraps the ovary and finally the achene; limb plano-compressed, shortly 4-fid at the apex. *Anthers* entire and obtuse at the base. *Style-branches* truncate. *Achenes* of ray florets flattened, with a wide membranous wing, glabrous; of disc-florets wingless, but folded in the ear-like appendage of the corolla. *Pappus* 0.

A small annual herb; leaves opposite, connate at the base, linear, entire or pinnatisect; heads medium-sized, solitary and long-peduncled at the apices of the branches.

Endemic; species 1, recorded only from the Cape district.

9351

132. COTULA, Linn.

Heads heterogamous, discoid, or very rarely homogamous through the absence of the female florets. *Involucre* hemispherical or campanulate; bracts sub-2-seriate, a little unequal, herbaceous or membranous, with the margin often narrowly scarious. *Receptacle* flat, convex, or conical, nude. *Marginal florets* female, in 1 to many rows. *Corolla* shortly conical, or 0. *Disc florets* bisexual, fertile or sterile. *Corolla* with a slender or 2-winged tube; limb shortly 4-fid. *Anthers* obtuse and entire at the base. *Style-branches* truncate, or obtuse, or rarely the style undivided in the sterile florets. *Achenes* plano-compressed, often with winged margins, glabrous or hispid; those of the ray florets mostly stipitate; those of the disc florets less winged and often sub-sessile. *Pappus* 0.

Small annual herbs; softly villous or glabrous; leaves alternate, pinnatifid, or pinnately-dissected, rarely undivided and toothed; heads small or rarely medium-sized, more or less peduncled.

Species about 55, found in temperate and sub-tropical regions, also in extra-tropical South America and Australia; 25 species in South Africa, fairly widely distributed.

9351a

133. CENIA, Juss.

Heads heterogamous, discoid, or rarely sub-radiate, or homogamous through the absence of the female florets. *Involucre* sub-hemispherical; bracts in 2 rows, sub-equal, ovate, membranous. *Receptacle* somewhat convex,

nude, on the hollow turbinate apex of the peduncle. *Marginal florets* in 1 to many rows, female. *Corolla* 2-3-lobed or ligulate, very rarely absent. *Disc florets* bisexual, fertile or sterile. *Corolla* with the tube sometimes compressed above the achene, sometimes short and terete, with the limb continuous or campanulate and shortly 4-fid. *Anthers* obtuse and entire at the base. *Style-branches* truncate. *Achenes* 2-winged or with a single rib, those of the central florets often slender and empty, glabrous. *Pappus* 0.

Annual or perennial herbs, often softly villous; leaves alternate, pinnately-dissected, often crowded at the base of the stem; heads medium-sized or small, long-peduncled.

Endemic; species 8, fairly widely distributed.

(NOTE.—This genus is usually included under *Cotula*, Linn., but can be distinguished by the peduncle being hollow at the apex.)

9356

134. SCHISTOSTEPHIUM, Less.

Heads heterogamous, discoid, or homogamous by the absence of the marginal florets. *Involucre* campanulate or sub-hemispherical; bracts in many series, imbricate, dry, adpressed, sometimes narrow, scarcely marginate, sometimes wide with a scarious margin. *Receptacle* convex, or at length ovoid-conical, nude, or with a few marginal paleæ. *Marginal florets* female, in 1 to many rows. *Corolla* shorter than the style, 3-4-toothed or 2-fid. *Disc florets* fertile, or the inner sterile. *Corolla* with the limb not widened and 4-toothed. *Anthers* entire and obtuse at the base. *Style-branches* truncate. *Achenes* of the female florets obovate, pilose; of the disc florets 4-angled, glabrous. *Pappus* 0.

Herbs or undershrubs, silky-villous or glabrate; leaves alternate, fan-shaped and incised, or once or twice pinnatisect; heads small, arranged in corymbs at the apex of the branches, solitary and long-peduncled in one species.

An African genus of 12 species; 8 species in South Africa, extending from the Transvaal, Basutoland, and Natal to Albany.

9357

135. HIPPIA, Linn.

Heads heterogamous, discoid. *Involucre* hemispherical; bracts in 2 rows, membranous, sub-scarious, a little unequal. *Receptacle* somewhat convex, nude. *Marginal florets* female, in 1-2 rows. *Corolla* tubular, sometimes very short, sometimes longer and thick, 3-4-toothed. *Disc florets* bisexual, sterile. *Corolla* with a terete tube and a widened sub-campanulate 5-fid limb. *Anthers* entire and obtuse at the base. *Style-branches* very short, truncate. *Achenes* glabrous; of the female florets dorsally compressed, marginate or winged; of the bisexual florets slender, empty. *Pappus* 0.

Herbs or undershrubs, aromatic; leaves alternate, pinnatifid or pinnatisect, rarely entire; heads small, arranged in corymbs at the apex of the branches.

Endemic; species 6, found in the south-western and south-eastern districts; recorded also from Koumga and Queenstown.

9358

136. ARTEMISIA, Linn.

Heads heterogamous, discoid, or homogamous by the absence of the female florets. *Involucre* ovoid or broadly campanulate; bracts in a few series, imbricate, with scarious margins; the outer gradually smaller. *Receptacle* flat, convex, or hemispherical, nude or hirsute-fimbriate. *Marginal florets* in one row, female, fertile. *Corolla* narrowly tubular, shortly 2-3-fid. *Disc florets* bisexual, fertile or sterile. *Corolla* with a terete tube, slender or thickened at the base, with a little-widened campanulate 5-fid

limb. *Anthers* obtuse and entire at the base. *Style-branches* truncate, often penicillate ; in the sterile florets connate or scarcely separate. *Achenes* obovoid, sub-terete, or often compressed, 2-ribbed, without ribs, or finely multi-striate, glabrous or pilose, rarely woolly. *Pappus* 0.

Herbs or undershrubs, often canescent, aromatic ; leaves alternate, entire incised or variously pinnately-dissected ; heads small, pendulous, or rarely erect in a panicle, or solitary, never in corymbs.

Species described about 300, but probably not all valid, mostly natives of the northern hemisphere ; 1 species in South Africa, common in the coastal districts, Natal, and the Transvaal ; rare in the inland districts.

9363

137. ASAEMIA, Harv.

Heads homogamous, discoid, with all the florets bisexual and fertile. *Involucre* ovoid ; bracts in many series, imbricate, obtuse, dry, coriaceous. *Receptacle* flat, nude. *Corolla* tubular, with a widened 5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* truncate, penicillate. *Achenes* oblong-linear, with 3-4 distant raised ribs, smooth. *Pappus* 0.

A branched shrub, often spinescent ; leaves small, opposite, connate at the base, crowded under the heads ; heads small, solitary and sessile between the fascicle of leaves.

Endemic ; species 2, found in the Karroo and S.W. Africa.

9364

138. GYMNOPENTZIA, Benth.

Heads homogamous, discoid, with the florets all bisexual and fertile. *Involucre* campanulate ; bracts in a few series, imbricate, dry, narrow, adpressed, sub-scarious at the apical margin ; the outer gradually smaller. *Receptacle* flat or somewhat convex, nude. *Corolla* tubular, terete, with the limb a little widened and 5-fid. *Anthers* entire at the base. *Style-branches* truncate and penicillate. *Achenes* sub-terete, many-ribbed, slightly puberulous. *Pappus* 0.

Shrubs, glabrous, or rarely pubescent with reflexed hairs ; leaves opposite-linear ; heads small, crowded and arranged in corymbs at the apices of the branches.

Endemic ; species 2, recorded from Somerset East, Queenstown, and the Drakensbergen.

9365

139. PEYROUSEA, DC.

Heads homogamous, discoid, with all the florets bisexual and fertile, or the inner sterile. *Involucre* hemispherical ; bracts in many series, narrow, silky-villous, scarious and acute at the apex ; the outermost a little smaller. *Receptacle* flat, nude. *Corolla* tubular, compressed, with the limb scarcely widened and 4-toothed. *Anthers* obtuse at the base. *Style-branches* truncate. *Achenes* obovate-oblong, obscurely ribbed, with a narrowly-winged margin, glabrous. *Pappus* 0.

An erect shrub, silky-villous ; leaves alternate, crowded, oblong-lanceolate ; heads large, shortly peduncled and arranged in corymbs at the apex of the branches.

Endemic ; species 1, found in the south-eastern districts.

9366

140. PENTZIA, Thunb.

Heads homogamous, discoid, with all the florets bisexual and fertile. *Involucre* ovoid or hemispherical ; bracts in many series, imbricate, dry, adpressed ; the inner often scarious at the apex ; the outer gradually shorter. *Receptacle* flat or convex, honeycombed or shortly fimbriate. *Corolla* tubular, terete or slightly compressed ; the limb a little widened and 5-fid.

Anthers entire at the base. *Style-branches* truncate and penicillate. *Achenes* angular, with 5 prominent ribs, glabrous, often glandular. *Pappus* of short paleae connate into a variously cut cup or eared crown, or rarely none.

Shrubs, cano-pubescent, glandular, or glabrous; leaves alternate, often small, fan-shaped and toothed or lobed towards the apex, or much divided; heads small or medium-sized, solitary or arranged in corymbs at the apex of the branches.

Endemic; species 30, widely distributed.

9369

141. STILPNOPHYTUM, Less.

Heads homogamous, discoid, with the florets all bisexual, or the inner sterile. *Involucre* ovoid or sub-globose, often shining; bracts in many rows, imbricate, obtuse, rigidly coriaceous; the outer gradually smaller. *Receptacle* flat, nude. *Corolla* with a slender tube and a campanulate 5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* truncate and penicillate. *Achenes* linear, glabrous; the outer 8-10-ribbed, 4-5-angled; the inner very finely striate, empty. *Pappus* 0.

Erect glabrous shrubs; leaves alternate, linear or oblong, entire; heads small or medium-sized, arranged in corymbs at the apices of the branches.

Endemic; species 4, recorded from George and Unionsdale and from the Transvaal.

9370

142. MARASMODES, DC.

Heads homogamous, discoid, with 4-5 to many florets; all the florets bisexual and fertile. *Involucre* ovoid; bracts in many series, imbricate; the outer scarious at the apex. *Receptacle* flat, naked. *Corolla* tubular, glandular, with a campanulate 5-fid limb. *Anthers* blunt at the base. *Style-branches* truncate and penicillate. *Achenes* terete, glandular (always?). *Pappus* of about 8 well-developed hyaline flat scales, about half as long as the corolla-tube.

Glabrous or hairy shrubs; leaves spreading or adpressed, glandular-punctate; heads solitary, few, or sub-glomerate.

Endemic; species 4, extending from Malmesbury to the Cape.

9370a

143. BRACHYMERIS, DC.

Heads homogamous, discoid, with all the florets bisexual and fertile. *Involucre* campanulate-ovate; bracts in many series, imbricate, adpressed. *Receptacle* flat, naked. *Corolla* pubescent or glandular-pubescent, with a short tube and a campanulate 5-fid limb. *Anthers* blunt at the base. *Style-branches* truncate and penicillate. *Achenes* terete, glabrous or scabrid. *Pappus* 0.

Glabrous or hairy shrubs; leaves alternate, glabrous or silky, not gland-dotted; heads solitary, or arranged in dense glomerate corymbs, or a few together.

Endemic; species 6, found in the central districts, but extend into Tembuland and the Transvaal.

9373

144. EREMOTHAMNUS, O.Hoffm.

Heads heterogamous, radiate. *Involucre* ovoid; bracts in many rows; outer bracts coriaceous, acuminate, mucronate; inner bracts longer and more slender, acuminate-mucronate. *Receptacle* honeycombed. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, minutely 3-toothed. *Disc florets* bisexual (fertile?). *Corolla* with a slender tube and a 5-fid limb. *Anthers*

sagittate at the base. *Style-branches* long, acute, hairy. *Achenes* densely silky. *Pappus* of many ciliate bristles.

Shrub: leaves alternate, albo-tomentose; heads somewhat large, sessile at the apices of the branches and surrounded by the upper leaves.

Endemic; species 1, found in S.W. Africa.

9377

145. *HERTIA*, Less.

(*Othonnopsis*, Jaub. and Spach. *Doria*, Less. partly)

Heads heterogamous, radiate or discoid. *Involucre* ovoid or campanulate; bracts in 1 row, oblong, sub-connate at the base, at length free and often reflexed. *Receptacle* flat or scarcely somewhat convex, nude. *Marginal florets* female, in 1 row, fertile. *Corolla* sometimes ligulate, with a spreading entire or 3-toothed lamina, sometimes shortly tubular and truncate. *Disc florets* bisexual, sterile. *Corolla* tubular, with a cylindric or campanulate 5-fid limb. *Anthers* entire at the base. *Style-branches* linear, slightly flattened, truncate and penicillate at the apex. *Achenes* of the female florets oblong, obscurely 5-10-ribbed, pubescent or villous; of the disc-florets slender, glabrous, empty. *Pappus* of copious slender bristles on the fertile achenes; of fewer bristles on the empty achenes.

Glabrous undershrubs; leaves alternate, sessile, somewhat fleshy; heads medium-sized or small, pedunculate, solitary at the apices of the branches, or in a short leafy panicle.

An African genus of 12 species; 11 species in South Africa, found in S.W. Africa and the central districts to Uitenhage; also occur in Natal and the Transvaal.

(NOTE.—N. E. Brown considers that this genus should be sunk under *Othonna*, Linn.)

9385

146. *STILPNOGYNE*, DC.

Heads heterogamous, discoid, with 7-8 florets. *Involucre* cylindric; bracts 5-7 in a single row, connate at the base. *Receptacle* flat, nude. *Marginal florets* about 3, female. *Corolla* filiform, with a small erect sub-ligulate often 2-3-toothed limb. *Disc florets* about 4-5, bisexual, fertile. *Corolla* tubular, with a cylindric shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* slender, truncate and penicillate at the apex. *Achenes* narrow, tapering at both ends, glandular-papillose. *Pappus* of scabrid bristles in the bisexual florets; absent from the female florets.

A small annual glabrous herb; leaves mostly radical, on long petioles, orbicular-cordate, sometimes cuneate at the base, toothed; the cauline leaves alternate, few or none; heads small at the apex of scapiform or sub-racemose stems.

Endemic; species 1; recorded from Little Namaqualand and Clanwilliam.

9391

147. *ALCIOPE*, DC.

Heads heterogamous, radiate. *Involucre* broadly campanulate or hemispherical; bracts in many rows, imbricate; the inner sub-equal; the outer shorter. *Receptacle* flat or somewhat convex, pitted. *Ray florets* female, in 1 row. *Corolla* ligulate, with a spreading scarcely 3-toothed limb. *Disc florets* bisexual, fertile. *Corolla* tubular, with a little widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* linear, flattened, sometimes broader above, obtuse. *Achenes* sub-terete, pubescent. *Pappus* of copious bristles, in 2-3 rows, slender, minutely barbellate.

Perennial herbs, woolly or tomentose; leaves alternate, woolly beneath, usually near the base of the stem; heads large, long peduncled, solitary or 2-3 in a corymb.

Endemic; species 2, found in the south-western districts.

9401

148. LOPHOLAENA, DC.

Heads homogamous, discoid, with the florets all bisexual and fertile. *Involute* ovoid-cylindric; bracts 5-6, in 1 row, herbaceous, keel-crested on the back, with scarios margins. *Receptacle* flat, pitted. *Corolla* tubular, with an elongated cylindric shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* sub-flattened, produced into a long hairy appendage. *Achenes* sub-5-angled, striate, minutely hirsute on the angles. *Pappus* bristles very copious, scabrid or barbellate.

Shrubs or undershrubs, glabrous or somewhat glaucous; leaves sessile, alternate, oblong or obovate, fleshy; heads sometimes medium-sized, shortly peduncled, crowded in dense leafy sub-corymbose panicles, sometimes large and solitary.

An African genus of 9 species; 5 species in South Africa, found in the Transvaal and Natal.

9405

149. GYNURA, Cass.

Heads homogamous, discoid, with the florets all bisexual and fertile, or rarely heterogamous with a few marginal florets female. *Involute* cylindric or sub-campanulate; bracts in sub-1-series, narrow, occasionally connate. *Receptacle* flat, pitted or shortly fimbriate. *Corolla* slender, tubular, with the limb a little widened and very shortly 5-fid (female corolla when present similar, but more slender). *Anthers* entire at the base or scarcely minutely sagittate. *Style-branches* slender, produced into long subulate hairy appendages. *Achenes* narrow, 5-10-striate, glabrous. *Pappus* of copious bristles in many rows.

Herbs, rarely low undershrubs, glabrous or hispid-pubescent; leaves alternate, entire, dentate, pinnately-lobed or dissected; heads medium-sized, in corymbs, or solitary at the apex of the branches.

Species about 65, found in the warmer parts of Asia and Africa, with 1 species in Australia; 2 species in South Africa, recorded from Natal and the Transvaal.

9406

150. CINERARIA, Linn.

Heads heterogamous, radiate, or rarely homogamous by the absence of the rays. *Involute* campanulate; bracts in 1 row, equal, often keeled. *Receptacle* flat, nude. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading sub-entire lamina. *Disc florets* bisexual, fertile or sterile. *Corolla* tubular, with an elongated 5-fid limb. *Anthers* entire or minutely sagittate at the base. *Style-branches* truncate and penicillate at the apex. *Achenes* of the rays or of all the florets ovate, dorsally compressed, often broad, 1-2-ribbed; disc achenes sometimes similar, sometimes 5-ribbed, often empty; all glabrous or villous. *Pappus* bristles slender, in 1-2 rows, caducous.

Herbs or undershrubs, more or less cano-tomentose or glabrate; leaves alternate, sometimes radical, often broad and incised-toothed, or variously pinnatisect, rarely entire; heads small or medium-sized, in lax corymbs at the apex of the branches.

Species about 64; 31 species in South Africa, fairly widely distributed.

9411

151. SENECIO, Linn.

(*Calalia*, Linn. partly; *Kleinia*, Linn.; *Mesogramma*, DC.)

Heads heterogamous, radiate, or homogamous by the absence of the rays. *Involute* cylindric, campanulate, or almost hemispherical; bracts in 1 row or sub-2 rows, free or more or less cohering, often keeled on the back,

or 3-nerved, with few or many small outer bracts. *Receptacle* flat or somewhat convex, nude, pitted, or shortly fimbriate. *Ray florets* female, in 1 row, fertile, rarely sterile. *Corolla* ligulate, sometimes with an elongated spreading lamina, sometimes small and revolute or scarcely conspicuous. *Disc florets* bisexual, fertile, or rarely some sterile. *Corolla* tubular, with a narrow elongated scarcely widened 5-fid limb, or abruptly narrowly or widely campanulate and more or less 5-fid. *Anthers* obtuse and entire at the base, or very shortly sagittate. *Style-branches* truncate and penicillate, rarely rounded or produced into a short broad or narrow appendage. *Achenes* sub-terete, or the outer slightly dorsally compressed, 5-10-ribbed, glabrous or villous. *Pappus bristles* copious, slender, entire, scabrid, or rarely barbellate, very rarely small or absent in the ray florets.

Herbs, undershrubs, or shrubs, rarely arborescent, glabrous or variously hairy; leaves alternate, sometimes radical, entire or variously cut; heads large, medium-sized, or small, solitary or in corymbs, very rarely in panicles; head or groups of heads either solitary in the forks of the branches or arranged in a racemose manner on the stem.

Species about 2,200, distributed all over the world; absent from the arctic and antarctic regions; about 235 species in South Africa, widely distributed.

9416

152. OLIGOTHRIX, DC.

Heads heterogamous, radiate. *Involucre* campanulate; bracts in 1 row, membranous, connate into a cup, free at the apex. *Receptacle* sub-flat, nude. *Ray florets* female, fertile, in 1 row. *Corolla* ligulate, with a short spreading or recurved lamina. *Disc florets* bisexual, fertile or sterile. *Corolla* tubular, with a narrow campanulate 5-fid limb. *Anthers* sub-entire at the base. *Style-branches* truncate and penicillate. *Achenes* oblong, somewhat compressed, 5-ribbed, with the ribs papillose-hirsute. *Pappus bristles* in 1 row, very slender, short, scabrid-barbellate, caducous.

Glabrous annual herbs; leaves alternate, sinuate-toothed, amplexicaul at the base; heads small, laxly paniced.

An African genus of 3 species; 1 species recorded from Clanwilliam and the Koude Bokkeveld.

9417

153. EURYOPS, Cass.

Heads heterogamous, radiate. *Involucre* campanulate or hemispherical; bracts in 1 row or sub-1 row, equal, more or less united into a cup. *Receptacle* flat, convex, or conical, nude or honeycombed-fimbriate. *Ray florets* in 1 row, female. *Corolla* ligulate, with a spreading sub-entire lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with an oblong or campanulate limb. *Anthers* entire at the base, or scarcely minutely sagittate. *Style-branches* more or less flattened, truncate and penicillate at the apex. *Achenes* ovoid or oblong-linear, 10-angled, glabrous or villous. *Pappus bristles* slender, numerous, caducous, scabrid or barbellate.

Glabrous or cano-tomentose shrubs; leaves alternate, often crowded, entire, incised, or pinnatisect; heads large or small, in the upper leaf-axils or peduncled at the apex of the branches.

Species about 50, all African; 43 species in South Africa, widely distributed.

9417a

154. LASIOCOMA, Bolus

Heads heterogamous, radiate. *Involucre* campanulate; bracts 6-7, in 1 row, sub-equal, almost connate into a cup to the middle, at length almost free, spreading. *Receptacle* flat, honeycombed, the margins of the pits with elevated paleaeform acuminate acute teeth. *Ray florets* 6-7, in 1

row, female, fertile. *Corolla* ligulate, with a small spreading 3-toothed lamina. *Disc florets* 9-12, bisexual, sterile. *Corolla* tubular, almost funnel-shaped, 5-fid. *Anthers* obtuse at the base. *Style-branches* sub-truncate, penicillate. *Achenes* of the ray florets club-shaped, dorsally compressed, densely covered with very long white hairs; of the disc florets slender, empty, shortly pubescent. *Pappus* in female florets none; in bisexual florets of numerous barbellate bristles in a single row.

An erect glabrous shrub; leaves alternate, 3-fid beyond the middle, usually with the middle lobe entire and the lateral 2-fid or 2-lobed; heads peduncled, axillary, solitary.

Endemic; species 1, recorded from Namaqualand and Calvinia.

9418

155. GYMNODISCUS, Less.

Heads heterogamous, radiate. *Involucre* campanulate; bracts 4-6, in 1 row, equal, sub-connate at the base. *Receptacle* small, flat, nude. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a short spreading sub-entire lamina. *Disc florets* bisexual, sterile. *Corolla* with a campanulate 5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* undivided; capitate-penicillate at the apex. *Achenes* of the female florets obovate, canescent, moist, mucilaginous; of the bisexual florets slender, empty. *Pappus* in female florets of a few short caducous bristles; in the disc florets none.

Erect glabrous annual herbs; leaves in a radical rosette, often lyrate-pinnatifid; cauline leaves few, alternate, amplexicaul; heads small, in corymbs at the apex of the branches.

Endemic; species 3, extending through the coastal districts from Namaqualand to Riversdale.

9419

156. RUCKERIA, DC.

Heads heterogamous, radiate. *Involucre* broadly campanulate; bracts in 1 row, equal, linear-lanceolate, coriaceous. *Receptacle* sub-flat, nude. *Ray florets* female, fertile, in 1 row. *Corolla* ligulate, with a spreading sub-entire lamina. *Disc florets* bisexual, sterile, or the outer fertile. *Corolla* tubular, with a little widened shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* slightly flattened, truncate, penicillate. *Achenes* obovate or oblong, variously compressed, angular-ribbed, with the apex contracted and cano-tomentose. *Pappus* in several rows, aggregated in woolly tufts, caducous; pappus sometimes absent from the central florets.

Perennial herbs, glabrous or laxly cano-tomentose; leaves radical, or the leaves cauline, alternate, rigid, pinnatisect; heads large, on a long leafless scape.

Endemic; species 3, recorded from the Clanwilliam district.

9420

157. OTHONNA, Linn.

(*Doria*, Less. partly.)

Heads heterogamous, radiate or discoid. *Involucre* campanulate or hemispherical; bracts in 1 row, more or less united into a smooth cup. *Receptacle* flat or convex, nude or pitted. *Ray* or *marginal florets* in one row, female, fertile. *Corolla* sometimes ligulate, with a spreading entire or 3-toothed lamina, or sometimes abbreviated, slender, truncate. *Disc florets* bisexual, sterile. *Corolla* tubular with a widened cylindric or campanulate 5-fid limb. *Anthers* entire at the base or very shortly sagittate. *Style-branches* of the bisexual florets undivided, capitate-penicillate. *Achenes* oblong, 5-10-ribbed; disc achenes empty. *Pappus* of copious bristles in many rows; of the disc florets fewer and caducous.

Shrubs, undershrubs, or herbs; leaves alternate, sometimes radical, entire, toothed, or dissected, often fleshy; heads medium-sized or small, peduncled, solitary or in paniced corymbs at the apices of the branches.

An African genus with 110 species; 96 species in South Africa, widely distributed.

9421

158. GAMOLEPIS, Less.

Heads heterogamous, radiate. *Involucre* campanulate or hemispherical; bracts in 1 row, connate at the base into a cup or urn, rarely sub-frec. *Receptacle* flat, convex, or sub-conical, nude or pitted. *Ray florets* female, fertile, in 1 row. *Corolla* ligulate, with a spreading often entire lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a widened shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* penicillate and truncate, or with a very short appendage. *Achenes* oblong, straight or curved, with 5-10 prominent ribs, glabrous. *Pappus* none.

Shrubs, rarely herbs, glabrous or sparsely and laxly woolly; leaves alternate, often crowded, entire or cut; heads medium-sized or small, peduncled at the apices of the branches.

Endemic; species 15, found in the coastal districts from Clanwilliam to Natal and then to the northern Transvaal.

9422

159. STEIRODISCUS, Less.

Heads heterogamous, radiate. *Involucre* broadly campanulate; bracts in sub-1 series, equal, with a scarious margin. *Receptacle* somewhat convex, nude. *Ray florets* in 1 row, female, fertile. *Corolla* with a spreading entire limb. *Disc florets* bisexual, sterile. *Corolla* tubular, slender, with a campanulate semi-5-fid limb. *Anthers* obtuse and entire at the base. *Style-branches* flattened, with a very short obtuse appendage. *Achenes* obovate, laterally compressed, hairy; of disc slender, empty. *Pappus* none.

Annual herbs; leaves alternate, pinnatisect; heads small, solitary on slender peduncles at the apices of the branches.

Endemic; species 4, extending from Van Rhynsdorp to Tulbagh.

9424

160. OLIGOCARPUS, Less.

(*Xenismia*, DC.)

Heads heterogamous, radiate. *Involucral bracts* in 1-2 rows, equal, linear, acuminate, with the margins sub-scarious. *Receptacle* flat, nude. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading 3-toothed lamina. *Disc florets* bisexual, sterile. *Corolla* tubular, with an ample 5-fid limb. *Anthers* sagittate (?) at the base. *Style* of the disc florets undivided. *Achenes* straight or curved, in each plant, or in each head polymorphous, glabrous; the 1-2 outer often elongated and narrow; the inner shorter, thicker, straight, minutely winged or obviously 3-winged, either beaked or quite beakless; beak, when present, sometimes solid, as long as the achene, horn-like or sometimes short and knob-like, or sometimes inflated hollow and cup-like. *Pappus* none.

Annual or perennial herbs, glandular-puberulous; leaves alternate, entire or sinuate-dentate; heads small, peduncled at the apex of the branches.

Species 4: 1 species in St. Helena; all in South Africa, found in the coastal belt from the south-western region to Natal; also recorded from a few central districts.

9425

161. DIMORPHOTHECA, Moench.

Heads heterogamous, radiate. *Involucre* broad; bracts in 1-2 rows, subequal, linear, acuminate, with the margins often scarious. *Receptacle* flat or somewhat convex, nude. *Ray florets* in 1 series, female, sterile or fertile. *Corolla* ligulate, with a spreading entire or acutely 3-toothed lamina. *Disc florets* bisexual; the outer fertile, or rarely sterile; the inner sterile, or rarely fertile. *Corolla* tubular, with a more or less widened 5-fid limb. *Anthers* rounded or sub-sagittate at the base. *Style-branches* flattened, truncate or very obtuse, undivided in the innermost flowers. *Achenes* glabrous; of the ray florets sub-3-angled, transversely rugose, tuberculate, or muricate, sometimes spinous-toothed along the margins, rarely smooth; achenes of disc florets, when fertile, plano-compressed, broad, surrounded by a thickened or winged margin. *Pappus* none.

Annual or perennial herbs or undershrubs, glabrous, scabrid-pubescent, or glandular-hairy; leaves alternate, sometimes radical, entire, toothed, incised, or pinnatifid; heads medium-sized or large, long-peduncled.

Species about 22, all African; 21 species found in South Africa, mostly in the coastal belt from Namaqualand to Natal and then to the Transvaal; a few species found in the central districts, and in the O.F.S.

9426

162. GARULEUM, Cass.

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in few or many rows, imbricate; the outer smaller; the inner scarious. *Receptacle* flat or convex, nude. *Ray florets* in 1-2 rows, female, fertile. *Corolla* ligulate, elongated, spreading. *Disc florets* bisexual, sterile. *Corolla* tubular, with a little widened 5-toothed limb. *Anthers* entire at the base. *Style-branches* narrow, with a lanceolate appendage, or style undivided. *Achenes* compressed or 3-angled, with the margins or angles thickened, transversely rugose or smooth; achenes of disc empty. *Pappus* none.

Perennial herbs or undershrubs; leaves crowded at the base of the stem, or the upper distant, alternate, pinnati-lobed or -sect; heads large or medium-sized, long peduncled, solitary or laxly panicle.

Endemic; species 6, found in the central districts, Natal, and the Transvaal.

9427

163. OSTEOSPERMUM, Linn.

Heads heterogamous, radiate. *Involucre* campanulate or sub-hemispherical; bracts in 1-3 rows, a little unequal or the outer smaller. *Receptacle* flat or convex, nude, or rarely bristly. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with an entire spreading limb. *Disc florets* bisexual, sterile. *Corolla* tubular, with a little-widened 5-fid limb. *Anthers* sagittate at the base (?). *Style* undivided or very shortly 2-lobed. *Achenes* thick, sub-terete, hard, rarely fleshy, sometimes obscurely and obtusely 3-10-ribbed, sometimes incurved-sub-reniform, glabrous, or rarely puberulous; achenes of disc empty. *Pappus* none.

Shrubs or undershrubs, rarely herbs, glabrous, laxly woolly, or cobwebby; leaves alternate or rarely opposite, entire, toothed, or pinnatifid; heads small or medium-sized, solitary and peduncled at the apices of the branches, or laxly panicle.

An African genus of 63 species; 52 species in South Africa, found chiefly in the coastal districts from Clanwilliam to Natal; also occur in the Transvaal, the O.F.S., and a few central districts.

9428

164. *TRIPTERIS*, Less.

Heads heterogamous, radiate. *Involucre* campanulate or wide; bracts sub-1-seriate, equal, linear, with the margins often scarious. *Receptacle* flat or somewhat convex, nude. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading entire or 3-toothed lamina. *Disc florets* bisexual, sterile. *Corolla* tubular, with a more or less widened 5-fid limb. *Anthers* sagittate at the base (?). *Style* undivided. *Achenes* of the ray florets 3-winged, with the wings rarely very narrow or almost absent, beaked, with the beak hollow, closed on one side with a hyaline membrane, glabrous. *Pappus* none, very rarely with the angles of the achene produced into 4 linear scales, more rarely scales 3 or 2.

Shrubs or undershrubs, often glandular-viscid; leaves alternate or opposite, entire, toothed, or cut; heads small or medium-sized, solitary or laxly paniced at the apices of the branches.

Species 36, mostly African; a few found in Australia, Brazil, and the Island of Socrota; 30 species in South Africa, fairly widely distributed.

9431

165. *URSINIA*, Gaertn.

(Sphenogyne, R.Br.)

Heads heterogamous, radiate. *Involucre* hemispherical or broadly campanulate; bracts in many series, imbricate; the inner with a broad scarious apex; the outer gradually shorter. *Receptacle* flat or convex, covered with paleae clasping or surrounding the bisexual florets. *Ray florets* in 1 series, neuter. *Corolla* ligulate, with a spreading lamina sub-truncate or minutely 3-toothed at the apex. *Disc florets* bisexual, fertile, or the inner sterile. *Corolla* with a slender tube dilated at the base, and an elongated slightly widened and shortly 5-fid limb. *Anthers* obtuse at the base. *Style-branches* with the apices dilated truncate and sub-penicillate. *Achenes* sub-terete, 5-10-ribbed, narrowed towards the base, surrounded at the base with a ring of long hairs, or nude, glabrous or pubescent. *Pappus* of about 5 obovate or cuneate obtuse broad scales, spirally rolled round each other, sometimes with 5 slender bristles as an inner pappus.

Annual or perennial herbs, or shrubby; leaves alternate, serrate, pinnatifid, or often pinnatisect; heads medium-sized, large or rarely small, long- or rarely shortly peduncled at the apices of the branches, or laxly paniced.

An African genus of 66 species; 1 species in Abyssinia; 65 species in South Africa, mostly in the coastal districts, extending from the Transvaal and Natal to Namaqualand: sparsely found in the central districts.

9432

166. *ARCTOTIS*, Linn.

(Microstephium, Less.; Damatris, Cass.)

Heads heterogamous, radiate. *Involucre* hemispherical; bracts in many rows; the inner broadly scarious at the apex; the outer gradually smaller; the outermost often small and linear. *Receptacle* flat or somewhat convex, honeycombed, with the pits often fimbriate or with long bristles. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading entire or rarely minute lamina. *Disc florets* bisexual, fertile. *Corolla* slender, with a little-widened elongated shortly 5-fid limb. *Anthers* entire at the base. *Style-branches* connate beyond the middle or to the apex, rounded at the apex, smooth or papillose on the outside. *Achenes* ovoid, villous, or surrounded at the base with long copious hairs, dorsally 3-5-winged or -ridged, with 2 collateral cavities on the back. *Pappus* in 2 rows, paleaceous;

the outer usually of 8 scales ; the inner of smaller scales ; or both rows of small scales.

Herbs, sometimes almost stemless, more or less cano-tomentose or woolly ; leaves alternate, sometimes radical, entire, sinuate-toothed, or pinnatisect ; heads large, on long peduncles.

An African genus of over 30 species ; 30 species in South Africa, fairly widely distributed.

9432a

167. VENIDIUM, Less.

Heads heterogamous, radiate. *Involucre* hemispherical ; bracts in many rows, imbricate ; the inner with the apex broadly scarious ; the outer shorter, or membranous-acuminate. *Receptacle* flat or somewhat convex, honeycombed. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading entire scarcely toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a more or less widened or campanulate 5-fid limb. *Anthers* entire at the base or minutely sagittate. *Style-branches* connate beyond the middle or to the apex. *Achenes* ovoid, dorsally 3-5-winged or -ridged, with 2 collateral cavities on the back, glabrous. *Pappus* none, or of 4 very minute unilateral scales.

Perennial herbs, cano-tomentose or woolly ; leaves alternate, entire, sinuate-toothed, or pinnatisect ; heads large, solitary, on long peduncles.

Endemic ; species about 20, found chiefly in the coastal districts from Namaqualand to Natal.

9432b

168. LANDTIA, Less.

Heads heterogamous, radiate. *Involucre* campanulate ; bracts in a few series, imbricate, oblong, obtuse, membranous ; the outer long-acuminate. *Receptacle* flat, nude or pitted. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading entire lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with an elongated widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* connate high up, shortly free and sub-orbicular at the apex. *Achenes* sub-4-angled, without wings, glabrous or surrounded at the base with a few hairs. *Pappus* of many delicate diaphanous obtuse scales.

Almost stemless perennial herbs ; leaves radical, sinuate-toothed or lyrate-pinnatifid, on both sides (or beneath only) albo-tomentose or woolly ; heads medium sized, sub-sessile between the leaves, or with short leaves on the scape ; the fruiting head often nodding.

An African genus of 4 species ; 2 species found in South Africa, recorded from the Cape, Stockenström, Albany, Cothcart, and Kingwilliamstown districts.

9432c

169. HAPLOCARPHA, Less.

Heads heterogamous, radiate. *Involucre* hemispherical ; bracts in many rows, imbricate ; the inner elongated, obtuse, membranous-scarious ; the outer gradually smaller ; the outermost small and narrow. *Receptacle* flat or convex, nude or shortly fimbriate. *Ray florets* in 1 row, female, fertile. *Corolla* ligulate, with a spreading entire or minutely 3-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a little-widened or campanulate 5-fid limb. *Anthers* sagittate at the base. *Style-branches* shortly spreading at the apex, rounded. *Achenes* turbinate, silky or glabrous, with a basal tuft of silky hairs. *Pappus* of many narrow tapering diaphanous nerved scales.

Almost stemless perennial herbs ; leaves radical, entire or toothed, cano-tomentose or woolly beneath ; heads large, solitary, on a scape longer than the leaves.

A South African genus of 4 species, one of which extends into tropical Africa ; found in the south-western and south-eastern districts and extend into Natal and the Transvaal.

9432d

170. ARCTOTHECA, Wendl.

Heads heterogamous, radiate. *Involucre* hemispherical ; bracts in many rows, imbricate ; the inner somewhat broad, scarious at the apex ; the outer gradually smaller ; the outermost narrow. *Receptacle* honeycombed, with the margins of the pits lacerated and often equalling the achenes. *Ray florets* in 1 row, neuter. *Corolla* ligulate, with a spreading minutely 3-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a little-widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* connate high up, with the apex shortly spreading and rounded. *Achenes* obovoid, somewhat 4-sided. *Pappus* none.

Perennial herbs, diffuse or creeping, cano-tomentose or woolly ; leaves alternate, lyrate-pinnatifid or pinnatisect ; heads large, peduncled, or the branches bearing the flowers abbreviated and sub-axillary.

Endemic ; species 1, found in the south-western districts.

9432e

171. CRYPTOSTEMMA, R.Br.

Heads heterogamous. *Involucre* hemispherical ; bracts in many rows broad, dry, sub-scarious ; the outer gradually smaller, often shortly ciliate at the apex. *Receptacle* flat, honeycombed, with the margins of the pits raised and membranous. *Ray florets* in 1 row, female, sterile. *Corolla* ligulate, spreading, sometimes with 1-2 lobes at the base. *Disc florets* bisexual, fertile, with a short tube and a campanulate 5-fid limb. *Anthers* sagittate at the base. *Style-branches* of bisexual florets connate high up, with the apex shortly free and rounded. *Achenes* of rays small, empty, naked ; of the disc ovoid, densely woolly. *Pappus* of 4-8 short obtuse paleae, crown-like.

Diffuse or creeping herbs, sometimes sub-caulescent, cano-tomentose ; leaves alternate, sometimes radical, toothed, or lyrate-pinnatifid, scabrid-villous above, albo-tomentose or woolly beneath ; heads large, peduncled, or solitary on a leafless scape.

Species 3, natives of Africa, Australia, and Lusitania ; 2 species in South Africa, extending from the Cape to Natal.

9433

172. GORTERIA, Linn.

Heads heterogamous, radiate. *Involucre* ovoid, or at length globose, hardened and closed in the fruit ; bracts in many rows, connate at the base, free above, very acute or spinescent. *Receptacle* flat, nude, or with the margins of the pits shortly hyaline and toothed, or covered with paleae. *Rays* in 1 row, sterile ; lamina spreading, sub-entire. *Disc florets* bisexual, fertile, or the innermost sterile. *Corolla* tubular, with a little-widened deeply 5-fid limb. *Anthers* shortly sagittate. *Style-branches* of the fertile disc florets linear, obtuse ; of the sterile florets undivided. *Achenes* obovoid or almost fusiform, pilose at the apex. *Pappus* none, or achenes crowned with short paleae.

Diffuse annual herbs, hispid ; leaves alternate, entire or toothed, scabrid-hispid above, hoary beneath ; heads medium-sized, sessile at the apices of the branches between the leaves, or shortly peduncled.

Endemic ; species 4, extending from S.W. Africa through the coastal districts to Riversdale.

9434

173. GAZANIA, Gaertn.

Heads heterogamous, radiate. *Involucre* urn-shaped or rarely broad; bracts in many rows, imbricate, connate high up, free above, linear or lanceolate, acute, unarmed. *Receptacle* flat or convex, shortly honeycombed. *Ray florets* in 1 row, neuter; lamina spreading, entire or minutely 2-3-toothed. *Disc florets* bisexual; the outer fertile; the inner often sterile. *Corolla* tubular, with a little-widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* of the fertile disc florets linear, obtuse or somewhat acute; of the sterile florets undivided. *Achenes* obovoid or turbinate, long and densely villous. *Pappus* of many paleae in 1 row; paleae linear, narrowly setaceous, acuminate, hyaline, 1-nerved, sometimes difficult to distinguish between the hairs of the achenes.

Annual or perennial herbs, sub-caulescent or diffuse, more or less canotomentose; leaves alternate, sometimes radical, entire or pinnatisect; head large or very large, solitary, long-peduncled, or in leafless scapes.

An African genus of 35 species; 30 species in South Africa, found chiefly in the coastal districts, extending from S.W. Africa to Natal, the O.F.S., and the Transvaal; recorded also from some of the central districts.

9435

174. HIRPICIUM, Cass.

Heads heterogamous, radiate. *Involucre* urceolate; bracts in many rows, imbricate, connate high up, free above, narrow, acute. *Receptacle* flat, margins of the pits membranous, often shorter than the achenes. *Ray florets* in 1 row, neuter; lamina elongated, spreading, sub-entire. *Disc florets* bi-sexual, fertile, or the innermost sterile. *Corolla* tubular, with a little-widened 5-fid limb. *Anthers* minutely sagittate. *Style-branches* of the fertile disc florets linear, obtuse. *Achenes* turbinate, long and densely villous. *Pappus* crown-like, at length divided into setae, or none.

Small shrubs, scabro-pubescent, unarmed; leaves small, alternate, with revolute margins, entire or ciliate; heads small, shortly peduncled at the apices of the branches.

Endemic; species 3, extending from Namaqualand to Riversdale.

9436

175. BERKHEYOPSIS, O. Hoffm.

Heads heterogamous, radiate. *Involucre* hemispherical; often with an involucre of more or less reduced leaves; bracts in many rows, connate for $\frac{1}{3}$ - $\frac{1}{2}$ of their length; the outer sometimes resembling reduced leaves; the inner membranous or with hyaline margins. *Receptacle* shortly conical, honeycombed; the pits shorter than the achenes. *Ray florets* in 1 row, neuter, with an elongated 5-nerved minutely 4-toothed lamina. *Disc florets* bisexual, fertile. *Anthers* minutely sagittate. *Style-branches* linear, obtuse. *Achenes* turbinate, 10-ribbed, densely covered with long hairs. *Pappus* of free hyaline paleae; the outer 10 paleae sub-equaling the achenes, with the margins lacerated above; the inner paleae much smaller and alternating with the larger.

Annual herbs; leaves alternate, rigidly setose; heads medium-size or large, solitary, peduncled (always?).

Endemic; species 4, found in S.W. Africa, the north-western districts and the Transvaal.

9437

176. CULLUMIA, R.Br.

Heads heterogamous, radiate. *Involucre* sub-globose or broad; bracts in many rows, connate at the base, free above, lanceolate or linear, rigid, spinescent; the outer, or all, spinose-ciliate. *Receptacle* honeycombed, with

the margins of the pits sub-spinose-fimbriate or toothed, enclosing the achenes. *Ray florets* in 1 row, neuter, with a spreading sub-entire lamina. *Disc florets* bisexual, fertile or a few of the innermost sterile. *Corolla* tubular, with a deeply 5-fid limb. *Anthers* sagittate at the base. *Style-branches* of the bisexual florets connate to the middle or high up, obtuse. *Achenes* oblong, angled, 5-10-ribbed, glabrous, truncate. *Pappus* 0, or achenes rarely with a globose appendage above.

Leafy shrubs or undershrubs, glabrous or cobwebby; leaves alternate, sessile, rigid, with reflexed or inflexed margins, spinous-toothed or ciliate, rarely entire; heads small or medium-sized, rarely large, terminal and sessile among the upper leaves.

Endemic; species 15, extending from the south-western districts to the Uitenhage district.

9438

177. BERKHEYA, Ehrh.

(*Stephanocoma*, Less; *Stobaea*, Thunb.)

Heads heterogamous, radiate, or homogamous by the absence of the rays. *Involucre* often wide; bracts in many rows, imbricate, more or less joined at the base, with the apices lanceolate, rigid, spinescent, and often spinyciliate. *Receptacle* sub-flat, honeycombed or pitted; pits deep, nearly enclosing the achenes, cleft at the apex into bristle-shaped fimbrials. *Ray florets* in 1 row, neuter. *Corolla* ligulate, with a spreading entire lamina. *Disc florets* bisexual, fertile, or a few of the inner sterile. *Corolla* tubular, with a little-widened 5-fid limb. *Anthers* sagittate at the base. *Style-branches* linear, obtuse; those of the sterile florets undivided. *Achenes* obovoid or turbinate, more or less distinctly 10-ribbed, villous or glabrous. *Pappus* of many paleae in 1-2 rows; paleae oval, obtuse and toothed at the apex, or lanceolate, or subulate, acute, or acuminate and shortly or deeply serrated.

Herbs or shrubs, often thistle-like; leaves radical, alternate or rarely opposite, at length decurrent, toothed, pinnatifid, or pinnatisect, with the teeth or the lobes spinescent; heads medium-sized or large, solitary or arranged in sub-corymbs.

An African genus of 114 species; 93 species in South Africa, found chiefly in the coastal districts and extending from S.W. Africa to Natal and the Transvaal; also found in many central and north-western districts, the O.F.S., and Basutoland.

9439

178. DIDELTA, L'Her.

Heads heterogamous, radiate, or homogamous by the absence of the rays. *Involucral bracts* in many rows, joined at the base, unarmed; the outer expanded into large leaf-like appendages; the inner small. *Receptacle* honeycombed, with the margins of the pits toothed or rigidly fimbriate. *Ray florets* in 1 row, neuter. *Corolla* ligulate, with a spreading 3-toothed lamina. *Disc florets* bisexual, fertile. *Corolla* tubular, with a little-widened 5-fid limb. *Anthers* shortly sagittate at the base. *Style-branches* linear, obtuse. *Achenes* turbinate or compressed, attenuate at the base, glabrous. *Pappus* of paleae arranged in a short lacerated cup, or of many bristles connate at the base.

Herbs or undershrubs; leaves alternate or opposite, entire or toothed, unarmed or spiny; heads large, terminal, shortly peduncled.

Endemic; species 3, extending from S.W. Africa to the Malmesbury district.

(NOTE.—The section *Cuspidia* of the "Flora Capensis" has been referred to the genus *Berkheya*, Ehrh.)

9441

179. PLATYCARPHA, Less.

Heads homogamous, with bisexual fertile florets. *Involucre* sub-globose or oblong; bracts in many rows, imbricate; the outer pungent-mucronate; the inner linear, resembling the paleae. *Receptacle* flat, covered with linear-subulate paleae, especially round the outer achenes. *Corolla* with a slender tube and an elongated narrow 5-fid limb. *Anthers* shortly sagittate or cordate at the base. *Style-branches* linear-subulate or oblong, minutely papillose. *Achenes* obscurely 10-ribbed, glabrous. *Pappus* of 5-10 narrow unequal paleae.

Sub-caulescent perennial herbs; leaves radical, pinnatisect and spinous-toothed, or sinuate-lobed and with the teeth blunt, white-woolly beneath; heads massed in a wide glomerule, sessile between the leaves at the apex of the stem.

An African genus of 3 species; 2 species in South Africa, extending from the Transvaal and Natal to the Uitenhage district: also recorded from the south-western districts.

9461

180. CARDUUS, Linn.

Heads homogamous, with the florets all bisexual and fertile, or by abortion unisexual. *Involucre* ovoid or globose; the bracts in many rows; the upper erect, spreading or recurved, spinescent or tipped with spines; the inner erect, sometimes scarcely spinescent, at length coloured. *Receptacle* flat or convex, densely setose. *Corolla* with a slender tube and with the limb equal or oblique, 5-fid to the middle or lower; the lobes narrow. *Filaments* pilose; anthers sagittate at the base. *Style-branches* short or very short, rarely long and filiform. *Achenes* glabrous. *Pappus* bristles in many rows, rigid, copious, serrulate, deciduous with the basal annulus.

Erect herbs; leaves alternate, often decurrent, serrate, sinuous-toothed, or pinnatifid, with the teeth or lobes spiny or rarely rigidly ciliate; heads small, medium-sized, or large, sometimes long-peduncled at the apices of the branches, sometimes loosely sub-sessile or glomerate.

Species about 60, found in Europe, Asia, north Africa, and the Canary Islands; a few species occur in South Africa as weeds.

9462

181. CIRSIUM, Scop.

(Cnicus, Linn.)

Heads homogamous, with the florets all bisexual and fertile, or unisexual by abortion. *Involucre* ovoid or globose; bracts in many series, imbricate; the outer gradually smaller, produced into long or short spines, sometimes pectinate-spinose; the inner often coloured, blunt, very rarely all blunt, or the few outer elongated leaf-like and spinose-pinnatifid. *Receptacle* flat, convex, or sub-conical, densely setose. *Corolla-tube* slender, with the limb equal or oblique, widened at the base, 5-fid to the middle or lower. *Filaments* more or less papillose-pilose, very rarely glabrous; anthers sagittate at the base. *Style-branches* linear or filiform, long or short, often surrounded at the base with a ring of hairs. *Achenes* obovate or oblong, more or less compressed or 4-angled, smooth or 4 to many-ribbed, glabrous. *Pappus* bristles in many rows, copious, rigid, plumose, deciduous with the basal annulus.

Herbs; leaves alternate, often decurrent, serrate or pinnately-lobed, with the lobes and teeth spinescent or rarely rigidly ciliate; heads sometimes solitary, aggregated or paniced at the apices of the branches, sessile and sub-spicate at the apex of the stem; in dwarf forms sometimes sub-sessile between the leaves at the apex of the stem.

Species about 150, found in Europe, north Africa, Asia, and north and central America: a few species naturalised in South Africa.

9463

182. CYNARA, Linn.

Heads homogamous, with the florets bisexual and fertile. *Involucre* broad or sub-globose; bracts in many series, imbricate, with a lanceolate or wide spiny appendage; the inner often coloured, erect and blunt. *Receptacle* fleshy, flat, densely setose. *Corolla-tube* slender, with the limb widened at the base, 5-fid to the middle or deeper. *Filaments* pilose; anthers sagittate at the base. *Achenes* somewhat compressed or 4-angled, glabrous. *Pappus-bristles* in many rows, plumose, deciduous with the basal annulus.

Erect thistle-like herbs, sometimes dwarf; leaves often ample, variously pinnatisect, with the lobes and teeth spinose; heads large, solitary at the apex of the branches, or on a simple stem.

Species 11, natives of the Mediterranean Region and the Canary Islands; a few species naturalised in South Africa.

9464

183. SILYBUM, Gaertn.

Heads homogamous, with the florets all bisexual and fertile. *Involucre* broadly sub-globose; bracts in many rows, imbricate, spinescent. *Receptacle* flat, densely setose. *Corolla-tube* slender, with the limb widened at the base, 5-fid to the middle or deeper. *Filaments* glabrous; anthers sagittate at the base. *Style* sub-entire, with the annulus pubescent toothed or pilose. *Achenes* obovate-oblong, compressed, glabrous. *Pappus bristles* in many rows, sub-paleaceous, deciduous with the basal annulus.

Erect thistle-like herbs; leaves alternate, white-spotted above, sinuate-lobed or pinnatifid, with the teeth or lobes spinose; heads large, solitary, terminal, nodding.

Species 2, found in south Europe, north Africa, and eastern Asia: 1 species naturalised in South Africa.

9476

184. CENTAUREA, Linn.

Heads heterogamous, or rarely homogamous. *Involucre* ovoid or globose; bracts in many rows, imbricate; apices laxly appendaged, or spreading and scarious, or spinescent, or with lateral spines. *Receptacle* sub-flat, often fleshy, densely setose. *Marginal florets* in 1 row, neuter. *Disc florets* bisexual, fertile. *Corolla-tube* slender, with a cylindric or oblong straight or oblique limb, 5-lobed to the middle or deeper. *Anthers* sagittate at the base. *Style-branches* lanceolate or linear, thickened at the base, or with a ring of hairs. *Achenes* oblong or obovoid, compressed or obtusely 4-angled, glabrous or villous. *Pappus* in many rows, of rigid bristles or paleae; bristles serrate, barbellate, or plumose, sometimes caducous or sometimes absent.

Perennial or very rarely annual herbs, often cano-tomentose; leaves alternate, sometimes radical, entire or often toothed, incised, or once or twice pinnatisect; heads small, medium-sized, or large, often peduncled, solitary or in panicles, rarely axillary and with the floral leaves about as long as the head.

About 500 species described, but probably only about 300 valid; natives of Europe, north Africa, and Asia; a few in northern and southern extra-tropical America; 1 species in Australia; a few naturalised in South Africa.

9479

185. CNICUS, Gaertn.

Heads heterogamous. *Involucre* ovoid-globose; bracts in few series; the outer broadly foliaceous, spinose-toothed; inner in 2-3 rows, spinose-toothed and spinescent at the apex. *Receptacle* flat, very densely and long-setose. *Marginal florets* in 1 row, sterile. *Disc florets* bisexual,

fertile. *Corolla-tube* slender, with a widened cylindric limb, oblique above, 5-fid beyond the middle. *Filaments* papillose-villous; anthers only polliniferous above the middle, sagittate at the base. *Style-branches* short, linear-oblong, with a ring of hairs at the base. *Achenes* oblong-sub-terete, many-ribbed, glabrous. *Pappus* in 2 rows; bristles of both rows 10; the outer somewhat long, rigid, awn-like; the inner small, slender, fimbriate.

Low annual roadside herbs, pilose; leaves alternate, sinuate-pinnatifid, with the lobes and teeth spiny; heads large, terminal.

Species 1, native of south Europe and north-eastern Africa; found in South Africa as a weed.

9500

186. OLDENBURGIA, Less.

Heads homogamous, radiate. *Involucre* broad; bracts in many rows, imbricate, woolly; the inner, or all, linear, acuminate. *Receptacle* flat, nude. *Ray florets* bisexual, fertile. *Corolla* bilabiate; the outer lobe strap-shaped; the inner lobe minute, bifid. *Disc florets* bisexual, female. *Corolla* nearly regular, deeply 5-fid. *Anthers* sagittate at the base. *Style* filiform, very shortly 2-fid, thickened near the apex. *Achenes* oblong, silky-villous. *Pappus* bristles rigid, unequal, shortly plumose.

Shrubs or undershrubs, sometimes dwarf, densely woolly; leaves alternate, or crowded beneath the head, thick, coriaceous, entire; heads large, sessile between the leaves, or 1-3-nate at the apex of the stem.

Endemic; species 3, extending from the south-western districts to the Albany district.

9501

187. DICOMA, Cass.

Heads homogamous or heterogamous. *Involucre* sub-globose or sub-campanulate; bracts in many rows, imbricate, ovate, lanceolate, or linear, acuminate, spinescent-mucronate, or tipped with a long spine; the outer gradually smaller; the inner at length with membranous wings. *Receptacle* flat, nude, often pitted. *Marginal florets* (when present) neuter. *Corolla* ligulate, 2-lipped, sometimes terete. *Disc florets* bisexual, all fertile, or the inner sterile. *Corolla* tubular, with a little-widened 5-parted limb; the lobes erect or revolute. *Anthers* sagittate at the base, with the tails barbed. *Style-branches* short, sometimes very short so that the apex of the style appears almost only emarginate, erect, obtuse. *Achenes* turbinate, densely villous, 5-10-ribbed. *Pappus* bristles in 2 to many rows, uniform and all barbellate or plumose, or dimorphous with the outer setae barbellate and the inner broader with more or less membranous margins.

Herbs or low shrubs; leaves alternate, entire or toothed; heads medium-sized or large, solitary in the forks of the branches, or sub-sessile between the upper leaves.

An African genus of 40 species, 1 species found in east India; 18 species in South Africa, extending from the Transvaal and Natal through the coastal belt to the Cape; also occur in S.W. Africa, the north-western and central districts, the O.F.S. and Basutoland.

9528.

188. GERBERA, Gronov.

(*Perdicium*, Linn.)

Heads heterogamous, radiate, or rarely homogamous by the absence of the rays. *Involucre* turbinate or broadly campanulate; bracts in 2 to many rows, imbricate, lanceolate or linear, acute; the outer gradually smaller. *Receptacle* flat, nude or slightly pitted. *Ray florets* in 1-2 rows,

often female. *Corolla* 2-lipped; the outer lip 3-toothed; the inner lip bifid. *Disc florets* bisexual, fertile. *Corolla* 2-lipped. *Anthers* sagittate at the base. *Style-branches* linear, sub-flattened, obtuse. *Achenes* more or less compressed, 5-ribbed, papillose-villous, usually beaked. *Pappus* bristles copious, slender, slightly scabrid.

Stemless herbs; leaves radical, entire or sinuate-pinnatifid, tomentose or woolly beneath, rarely glabrous on both surfaces; heads medium-sized or large, solitary at the apex of a leafless scape, or the scape with a few scales.

Species about 55, mostly African; a few found in the warmer parts of Asia, east India, Japan, and Brazil; 24 species in South Africa, extending from the Transvaal and Natal through the coastal belt to the Cape.

9553

189. CICHORIUM, Linn.

Heads homogamous, ligulate. *Inner bracts* sub-1-seriate, sub-coriaceous or herbaceous above, concave at the base and containing the outer achenes; the outer few, smaller, unequal or sub-equal. *Receptacle* somewhat flat, nude or sparsely fimbriate. *Corolla* ligulate, truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender, somewhat obtuse. *Achenes* sub-5-angled, more or less contracted at the base, truncate, or with a slightly prominent crown at the apex, glabrous. *Pappus* of short paleae; paleae sometimes minute, numerous, in 2-3 rows.

Erect herbs, with rigid branches, sometimes spinescent, glabrous or sparsely hispid; leaves alternate, pinnatifid or deeply toothed, becoming narrow and entire above; heads axillary.

Species 7 or 8, found in the Mediterranean Region, Abyssinia, Europe, and Asia; 1 species naturalised in South Africa.

9572

190. HYPOCHOERIS, Linn.

Heads homogamous, ligulate. *Involucre* oblong-cylindric or campanulate; bracts in many rows, imbricate. *Receptacle* flat, covered with narrow often hyaline paleae subtending the florets. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender, somewhat obtuse. *Achenes* oblong or linear, terete or compressed, 10-ribbed, produced at the apex into a slender beak, or rarely shortly produced or beakless, with the ribs scabrid or shortly ciliate. *Pappus* bristles in 1 row, long, plumose, at length with many smaller alternating or outer bristles.

Perennial, rarely annual herbs; leaves in a radical rosette, entire, toothed, or pinnatifid; heads medium-sized, long-peduncled or solitary on the scapes.

Species about 50, natives of Europe, the Mediterranean Region, northern Asia, and South America; two species naturalised in South Africa.

9573

191. UROSPERMUM, Scop.

Heads homogamous, ligulate. *Involucre* campanulate, softly or stiffly hairy; bracts 7-8 in 1 row, equal, herbaceous, acute, connate at the base. *Receptacle* conical, nude. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender. *Achenes* linear-oblong, sub-terete, often incurved, 5-10-ribbed, produced into a long beak, glabrous. *Pappus* bristles in 2 rows, softly plumose, connate at the base and deciduous in a ring.

Annual or biennial herbs, pubescent or hispid with rigid hairs; leaves alternate, sometimes radical, deeply toothed or lyrate-pinnatifid, amplexicaul; fruiting heads large, long-peduncled at the apices of the branches.

Species 2, natives of the Mediterranean Region; 1 species naturalised in South Africa.

9579

192. TRAGOPOGON, Linn.

Heads homogamous, ligulate. *Involucre* cylindric or narrowly campanulate ; bracts in 1 row, herbaceous, acuminate, sub-connate at the base. *Receptacle* flat or at length convex, pitted, with the margins of the pits often cartilaginous. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender. *Achenes* linear, terete or 5-angled, 5-10-ribbed, produced into a slender rarely shortened beak, or in the marginal achenes the beak almost absent, glabrous, rarely hispid, muricate on the ribs or smooth. *Pappus bristles* many, in 1 row, plumose, connate in a ring at the base ; the pappus of the marginal achenes sometimes sub-paleaceous and distinct, nude or plumose at the base.

Biennial or perennial herbs, glabrous or here and there woolly ; leaves alternate, linear, entire, amplexicaul, often grass-like ; heads terminal, peduncled.

Species about 40, natives of Europe, the Mediterranean Region, eastern and central Asia ; naturalised in South Africa.

9593

193. LAUNAEA, Cass.

Heads homogamous, ligulate. *Involucre* campanulate or cylindric ; bracts in many rows, imbricate, membranous-herbaceous, often with scarious margins. *Receptacle* flat, nude. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender. *Achenes* narrow, sub-terete, prominently 4-5-ribbed, glabrous or minutely papillose. *Pappus bristles* copious, in many rows, at length woolly, deciduous with the basal annulus.

Perennial herbs, sometimes creeping, glabrous ; leaves radical, or a few on the lower portion of the stem, sinuate-toothed or pinnatifid, with the margins often cartilaginous or spiny-toothed ; heads peduncled, or sub-sessile in the forks of the branches, solitary, or in lax corymbs or glomerules.

Species about 20, natives of the Mediterranean Region, east India, and the Canary Islands ; 1 species in South Africa, found along the coast from Natal to the Uitenhage district.

9595

194. SONCHUS, Linn.

Heads homogamous, ligulate. *Involucre* ovoid or campanulate, often dilated at the base or conical, rarely the involucre cylindric ; bracts in many rows, imbricate, herbaceous, membranous. *Receptacle* flat, nude. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender. *Achenes* oval, oblong, or narrow, more or less compressed, 10-20-ribbed, beakless, glabrous, with the ribs smooth or transversely rugose. *Pappus bristles* copious, in many rows, slender, deciduous with the basal annulus.

Annual or perennial herbs ; leaves alternate, sometimes radical, often amplexicaul, entire, toothed, pinnatifid, or cut, with the margins at length rigidly ciliate or spinulose ; heads medium-sized or large, in irregular corymbose-panicles or in sub-umbels at the apex of the branches, rarely solitary.

Species about 40, found in Europe, Asia, Africa, and Australia ; about 4 species in South Africa, found in Natal, Basutoland, and the north-eastern districts.

9596

195. LACTUCA, Linn.

Heads homogamous, ligulate. *Involucre* cylindric, narrow, or rarely somewhat broad, sometimes a little widened at the base ; bracts in a few series, imbricate, membranous-herbaceous, with scarious margins. *Receptacle*

flat, nude. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Achenes* oval, oblong, or narrow, more or less compressed, often flat, abruptly beaked or gradually narrowed into a beak, 3-5-ribbed. *Pappus* bristles copious, in many rows, very slender, persistent or caducous.

Herbs, glabrous or very rarely hispid-pilose; leaves alternate, sometimes radical, entire, deeply toothed or pinnatifid, with the margins setose-ciliate or nude, often amplexicaul; heads variously paniced, or sessile or peduncled in the forks of the branches.

Described species about 100, found in northern Europe, Asia, Africa, and America; 2 species in South Africa, fairly widely distributed.

9605

196. CREPIS, Linn.

(*Anisorhamphus*, DC.)

Heads homogamous, ligulate. *Involucre* cylindric, campanulate, or at length widened at the base; inner bracts in 1 row; outer in a few rows, linear, or rarely broad. *Receptacle* flat or rarely concave, nude or shortly fimbriate. *Corolla* truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender. *Achenes* oblong-linear, 10-20-ribbed, constricted at the apex or produced into a beak, glabrous. *Pappus* bristles often copious.

Perennial or annual herbs, glabrous, or often pilose; or hispid, with erect leafy branches, or branches leafless; leaves alternate, sometimes radical, often amplexicaul, entire, or often deeply toothed or pinnatifid; heads of various sizes, peduncled, solitary or variously paniced.

Species about 200, widely dispersed in the northern hemisphere; 1 species in South Africa, found in the eastern districts, Basutoland, the Transvaal, and Natal.

9607

197. HIERACIUM, Linn.

Heads homogamous, ligulate. *Involucre* cylindric-campanulate or wide; bracts narrow, herbaceous. *Receptacle* flat, nude or shortly fimbriate. *Corolla* ligulate, truncate and 5-toothed at the apex. *Anthers* sagittate at the base. *Style-branches* slender. *Achenes* oblong, 10-(rarely 15-) ribbed, terete, or with 4-5 ribs prominent, truncate at the apex, glabrous. *Pappus* bristles copious, in 1-2 rows, persistent.

Perennial herbs, rarely glabrous; leaves alternate, sometimes radical, entire, toothed, or rarely sub-pinnatifid; heads sometimes on a leafless scape, or solitary on a long peduncle, sometimes in a more or less leafy lax panicle or sub-corymb.

Published species about 400, of which less than half are legitimate; natives of Europe, North and South America, the Orient, north Africa, north and east Asia; 1 species in South Africa, found in the south-eastern and eastern districts Natal, Basutoland, and the Transvaal.

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